TECHNOLOGY REVIEW

June 1957

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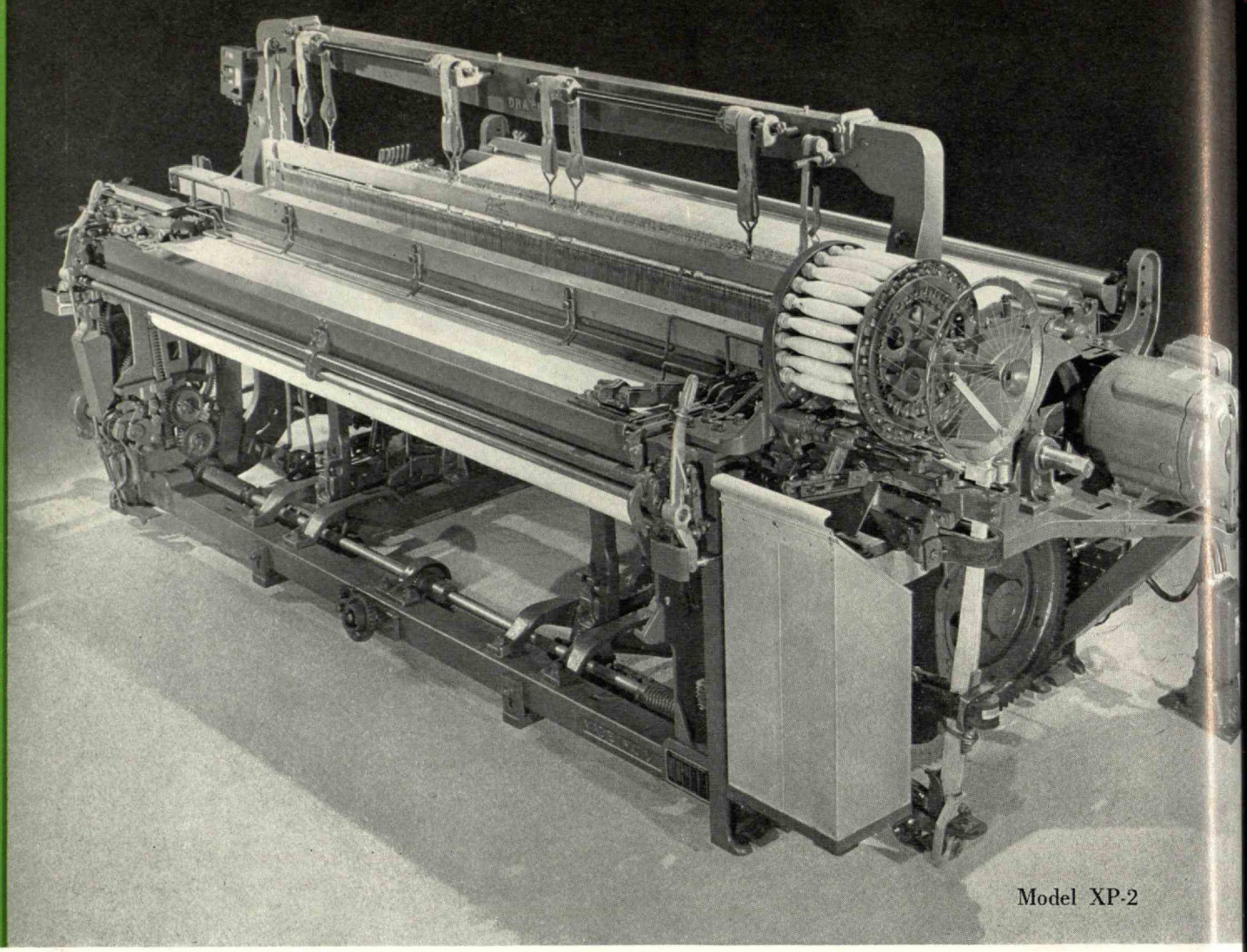

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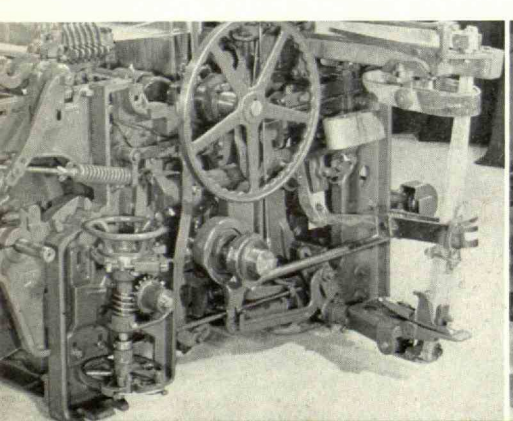

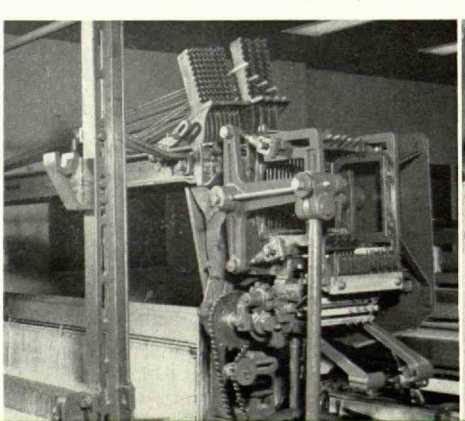

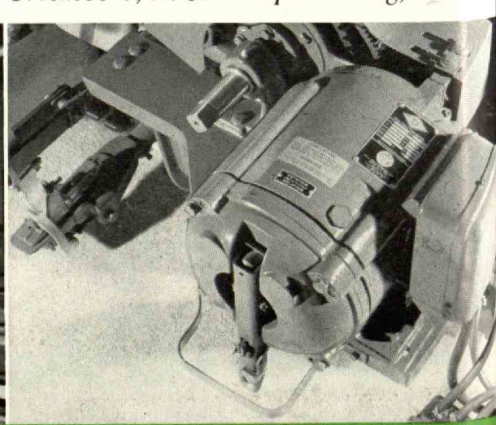

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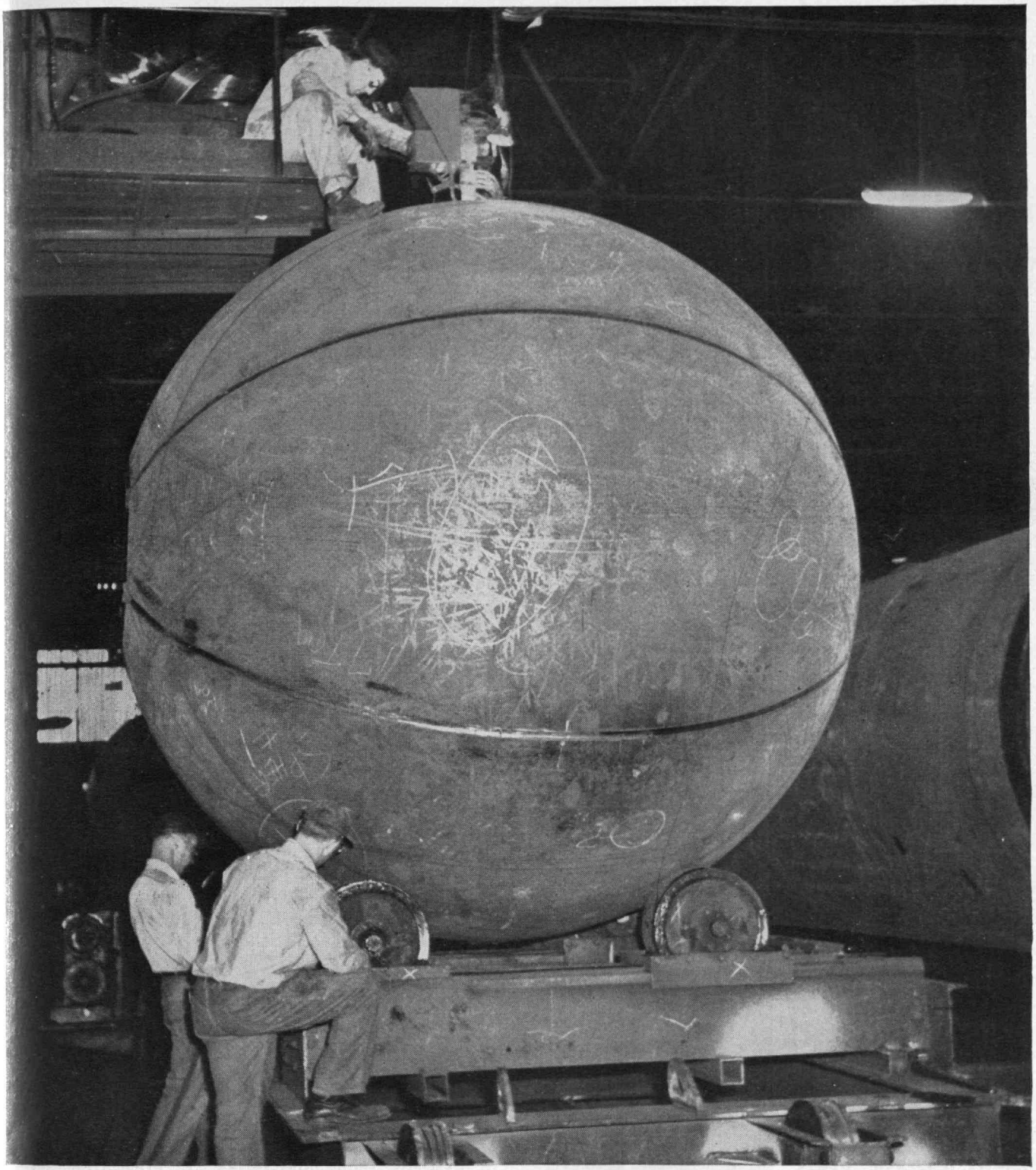

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THE TABULAR VIEW

Management Convocation. — The summary report of the Fifth Anniversary Convocation of the School of Industrial Management (page 403) has been prepared by The Review's editor with the assistance of members of the School of Industrial Management and the M.I.T. Photographic Service. It may also be well to remind Review readers that "Individuals Noteworthy" and "Twenty-five Years Ago This Month," which have been features of the Trend of Affairs in this volume, are the work of H. E. LOBDELL, '17, publisher of The Review.

Tomorrow's Managers. — Banquet address of the convocation of the School of Industrial Management, on April 9, was given by CLEO F. CRAIG, chairman of American Telephone and Telegraph Company's Board of Directors, which The Review is happy to present on page 409. Mr. Craig's telephone career began in 1913 upon his graduation from the University of Missouri with a degree in electrical engineering. When he was graduated at the age of 20 he was a member of Tau Beta Pi and Eta Kappa Nu. He progressed through the Bell System becoming District Plant Superintendent in 1920, Plant Accountant in 1922, Special Representative in the Vice-president's Office in 1927, General Manager of Long Lines Department in 1933, Vice-president in charge of Long Lines in 1940, Vice-president in charge of Personnel in 1941, Vice-president of Operation and Engineering Department in 1948, and President in 1951. He is a director or trustee of several corporations and public institutions. In 1952 he received the honorary LL.D. degree from his alma mater.

Financial Forces. — Luncheon speaker, at the April 9 convocation of the School of Industrial Management, was ELI SHAPIRO whose address appears on page 412 of this issue. Dr. Shapiro is professor of finance and associate dean of the School of Industrial Management. He received the B.A. degree from Brooklyn College (1936), and the M.A. and Ph.D. degrees from Columbia University in 1937 and 1945. Further details about him appear in the Institute Gazette section of The Review for January, 1955.

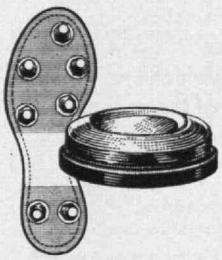
Systems Technology. — JAY W. FORRESTER, '45 — whose biography appeared in detail in the Trend of Affairs section of The Review for November, 1956 — is the author of "Systems Technology and Industrial Dynamics" (page 417) presented at the April 9 convocation of the School of Industrial Management. The University of Nebraska awarded him the B.Sc. degree "with high distinction" in 1939 and the honorary D.Eng. in 1954. He received the S.M. degree from M.I.T. in 1945. Since last fall, Dr. Forrester has been professor of industrial management.

Life Sciences. — To those persons who still think of M.I.T. as primarily a school of engineering, "Life Sci-

(*Concluded on page 390*)

. . . pipes or purses

. . . cleats or clay pigeons



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THE TABULAR VIEW

(Concluded from page 388)

ences – M.I.T. Style" (page 423) may come as an eye opener. This survey of 117 M.I.T. projects in the life sciences was written by IRWIN W. SIZER, a member of the Institute's staff since 1935, and recently named head of the Department of Biology. He received the A.B. degree from Brown University in 1931 and the Ph.D. from Rutgers in 1935. Other biographical information on Dr. Sizer appeared in the Trend of Affairs section of The Review for March, 1957.

MAIL RETURNS

PROPER CREDIT

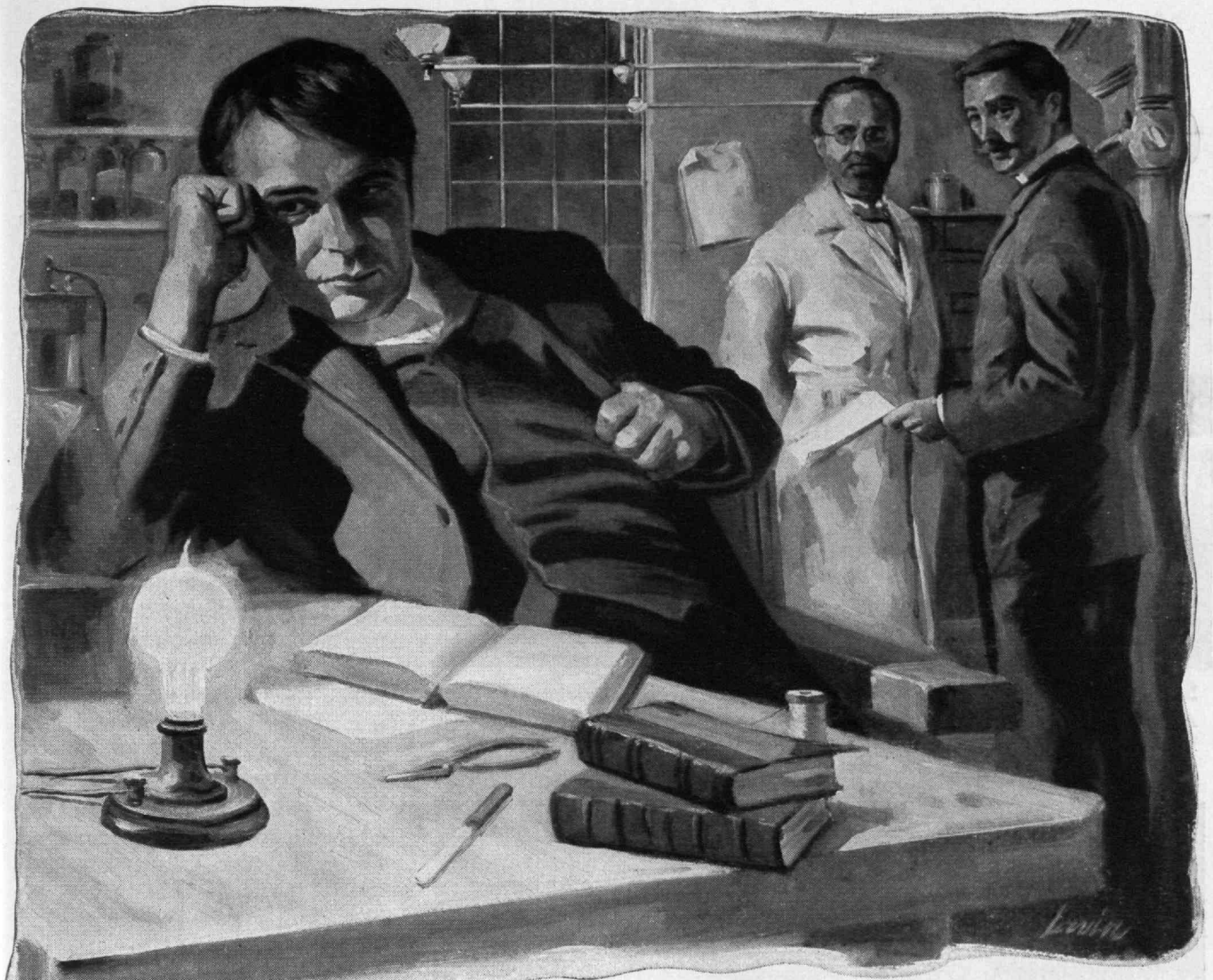
FROM PROFESSOR GORDON S. BROWN, '31:

I am very much pleased to note your insertion of three references (page 372) on the general topic of "Automation" at the conclusion of my article on Automation in the May, 1957, issue of The Review. I wish to point out, however, that I have been given more credit than I am entitled to receive for the authorship of two of the references.

The article on "Control Systems," published in the *Scientific American,* was prepared jointly with my colleague Dr. Donald P. Campbell as co-author. (Donald Pierce Campbell, a member of the Class of 1943, died on January 15, 1957.) This article may also be found in the volume entitled *Automatic Control* of the *Scientific American Books* published by Simon and Schuster in 1956. The article referenced in *American Machinist* was not written by me at all. The authors were William Stocker, Jr., C. D. Emerson, and the staff of the Servomechanisms Laboratory.

I would be grateful if you would bring these corrections to the attention of the readers of The Review.

Head, M.I.T. Department of Electrical Engineering, Cambridge, Mass.



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*H. G. Wells 1895

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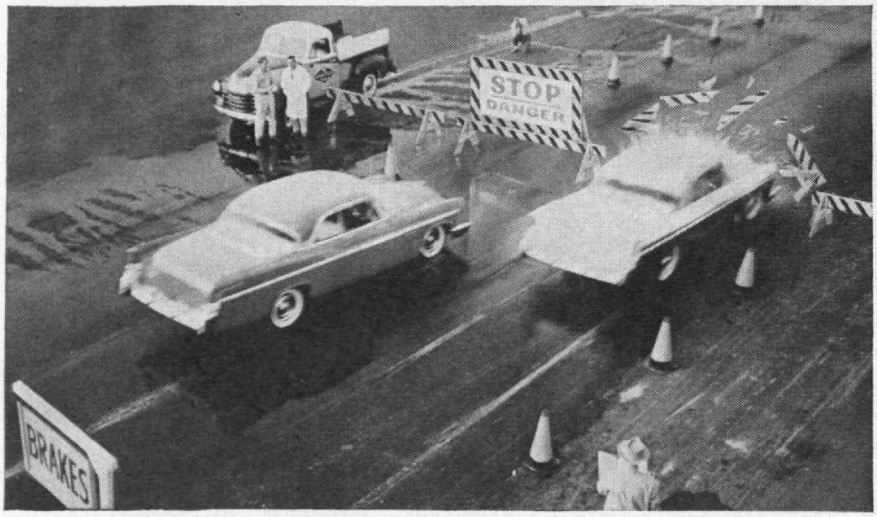

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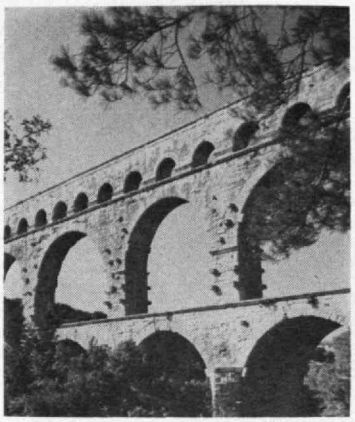

Paul L. Rittenhouse

Pont du Gard, Avignon

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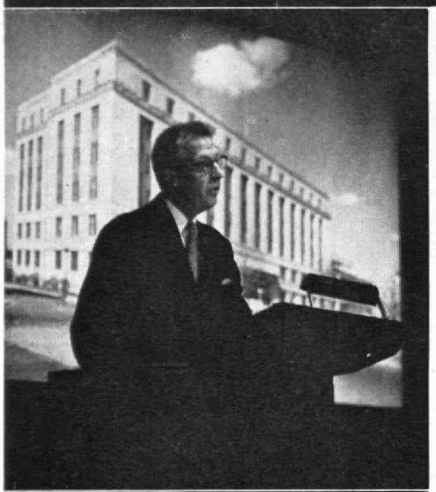
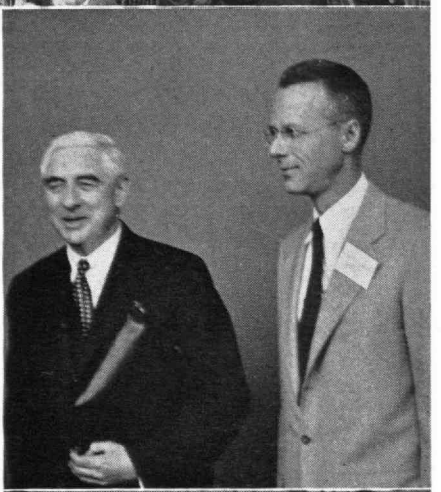
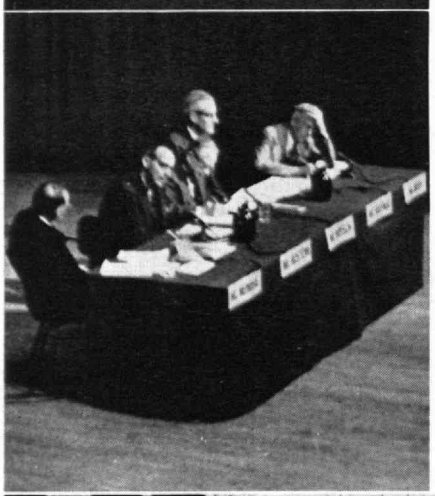
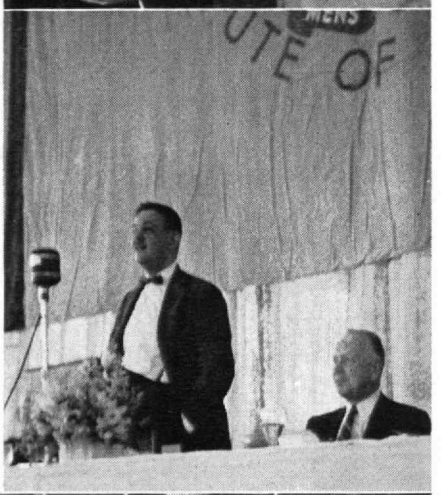


Anniversary Convocation

In celebration of five successful years of operation, the Institute's School of Industrial Management held a convocation in Cambridge on Tuesday, April 9, at which these informal scenes were caught by the M.I.T. Photo Service. In clockwise order, beginning at upper left corner are: (1) Guests registering in lobby of Kresge Auditorium; (2) catered luncheon in Rockwell Cage with speakers' table shown under M.I.T. banner; (3) E. P. Brooks, '17, Dean, School of Industrial Management, and Jay W. Forrester, '45, Professor of Industrial Management, both of whom spoke at the morning session; (4) Eli Shapiro, Associate Dean, School of Industrial Management and luncheon speaker, with J. A. Stratton, '23, M.I.T. Chancellor; (5) guests arriving for the banquet in the Hotel Sheraton Plaza in Boston; (6) President Killian at the banquet, flanked by Alfred P. Sloan, Jr., '95 (left), and Cleo F. Craig, who gave the principal banquet address; (7) members of panel group who discussed role of corporate director (left to right): Sidney L. Weinberg, Eugene V. Rostow, Lyman Bryson, David A. Shepard, '26, and Vannevar Bush, '16; and (8) Douglas M. McGregor, Professor of Industrial Management, a speaker at the morning session.







The Technology Review

VOL. 59, NO. 8 JUNE, 1957

The Trend of Affairs

The Voters Speak

■ Perhaps the elective process is the best possible demonstration of the workings of a truly democratic organization. Of the Institute's Alumni body, approximately 3,000 participated in the election of new officers to head the M.I.T. Alumni Association for the year beginning July 1, 1957.

Gilbert M. Roddy, '31, Vice-president of the Boston Manufacturers Mutual Insurance Company and Mutual Boiler and Machinery Insurance Company, was elected president of the Association for the 1957–1958 year. D. Reid Weedon, Jr., '41, Vice-president of Arthur D. Little, Inc., was elected to serve a two-year term as vice-president of the Association.

Raymond A. St.Laurent, '21, and William L. Taggart, Jr., '27, were each elected to serve two-year terms on the Executive Committee of the Association. Mr. St.Laurent is vice-president of Rogers Corporation, Rogers, Conn., and Mr. Taggart is executive vice-president of Dewey and Almy Chemical Company (Division of W. R. Grace and Company), Cambridge.

Alumni term members to serve on the M.I.T. Corporation for a five-year term were: Charles A. Chayne, '19, Vice-president in charge of Engineering Staff, General Motors Corporation; Theodore T. Miller, '22, President of Polymer Chemicals Division of W. R. Grace and Company (who is now serving as President of the Alumni Association for the fiscal year 1956–1957); and Clarence L. A. Wynd, '27, Vice-president of the Eastman Kodak Company, and assistant general manager of the Kodak Park Works in Rochester, N.Y.

Three-year terms, to serve on the National Nominating Committee, went to: Bissell Alderman, '35 (District 3); Henry Avery, '41 (District 6); and Edmund D. Ayres, '22 (District 7). Mr. Alderman is partner in the firm of Alderman and MacNeish, architects and engineers of West Springfield, Mass. He served as an officer of the M.I.T. Club of the Connecticut Valley during 1949–1951. Mr. Avery is general manager of the Industrial Chemicals Division, Pittsburgh Coke and Chemical Company. In 1953–1954 he was vice-president and in 1954–1955 president of the M.I.T. Club of Western Pennsylvania. Mr. Avery also serves as Assistant Secretary for his Class. Mr. Ayres is professor of electrical engineering at the Ohio State University in Columbus. He is also a member of the M.I.T. Club of Central Ohio (Columbus).

The 12 Alumni elected to represent their classes on the Alumni Council for five-year terms, beginning July 1, 1957, are: Edward S. Chapin, '98, Ichabod F. Atwood, '03, Joseph W. Wattles, 3d, '08, R. Charles Thompson, '13, Max Seltzer, '18, George A. Johnson, '23, Arthur A. Nichols, '28, Lincoln W. Ryder, '33, Albert O. Wilson, Jr., '38, Robert W. Anderson, '43, Richard H. Harris, '48, and Marion C. Manderson, '53.

Gilbert M. Roddy, '31 . . .
President of the Alumni Association for the year beginning July 1, 1957

M.I.T. Photo

Shell Christened for Cochrane

■ In christening ceremonies at the M.I.T. Boat House on Saturday, April 27, an eight-oared shell was named in honor of Admiral Edward L. Cochrane, '20, who will become special assistant to James R. Killian, Jr., '26, President, upon his retirement on July 1. As Vice-president for Industrial and Governmental Relations since 1954, Admiral Cochrane has been concerned with the whole range of M.I.T. responsibilities to industry and government. He has had the major responsibility for co-ordinating and giving administrative support to all of the Institute's sponsored research, including Lincoln Laboratory and the Instrumentation Laboratory.

Following his retirement from the Navy in 1947, where he had been chief of the Bureau of Ships, Admiral Cochrane served as head of the Department of Naval Architecture and for two years (1952–1954) was dean of engineering at the Institute.

Shown in the photograph above with Admiral Cochrane are: Michael A. Drew, '59 (left), lightweight crew manager; and Robert W. Root, '57, varsity lightweight crew captain.

The christening was done by Mrs. Cochrane. The bow of the light shell was suitably protected as a bottle of Charles River water was broken over it.

Alumni Day, 1957

■ The program for Monday, June 10, will retain many of the traditional features which have endeared Alumni Day to former M.I.T. students. There will be a morning conference, President Killian's luncheon in Du Pont Court, and the Alumni Banquet in the evening. But dedicatory services of the new Karl Taylor Compton Laboratories, with tours of these laboratories, as well as of the new nuclear reactor (under construction) and the Computer Center, will add new features to this year's program.

Julius A. Stratton, '23, Chancellor of M.I.T., will preside at the morning symposium on "Today's Science – Tomorrow's Promise." Speakers will be James B. Fisk, '31, Executive Vice-president of the Bell Telephone Laboratories, and Jerrold R. Zacharias, Professor of Physics at the Institute. Dr. Fisk will describe many of the latest research programs in the physical sciences, particularly those in electronics and communications. Dr. Zacharias will tell how scientists are at work on an educational program aimed to promote a better understanding of science by laymen and to develop more significant programs of instruction in physics at the high school level.

At luncheon, in Du Pont Court, Dr. Killian will describe developments at M.I.T., the problems of meeting increased college enrollment, the needs for more graduates in science and engineering, and the increasing demands being placed on professional men in the physical sciences.

The Karl Taylor Compton Laboratories will be dedicated during a program commemorating the vision of Dr. Compton in advancing the frontiers of educational and scientific knowledge. Among those taking part in this program will be: Vannevar Bush, '16, Chairman of the M.I.T. Corporation; James R. Killian, Jr., '26, President of M.I.T.; Thomas J. Watson, Jr., President of International Business Machines Corporation; and George R. Harrison, Dean of the School of Science. The nuclear reactor, now under construction, and the Computation Center in the Compton Laboratories will also be open for inspection.

A pre-dinner gathering on the green of Briggs Field will provide opportunity to visit with classmates and other friends. The Alumni Banquet in Rockwell Cage will be followed by a minimum amount of business of interest to all Alumni.

Feature of the evening will be a performance of the Boston Pops Orchestra, under the direction of Arthur Fiedler. For the first time, this famous orchestra will perform in the Institute's acoustically superb Kresge Auditorium.

I.R.A. Regatta

■ The M.I.T. Crew will participate in the 55th annual regatta of the Intercollegate Rowing Association, to be held at Onondaga Lake, Syracuse, N.Y., on June 22. This will be the sixth consecutive year that Onondaga Lake will be the race site, and 12 schools will be represented – Boston University, California, Columbia, Cornell, Dartmouth, M.I.T., Navy, Pennsylvania, Princeton, Stanford, Syracuse, and Wisconsin.

There will be three races – the three-mile varsity and junior varsity, and the two-mile freshman races. This annual event draws rowing fans from all parts of the country to support their favorite crews. Tickets and further information may be obtained from the Syracuse Regatta Association, Department of Athletics, Syracuse University, Syracuse 10, N.Y.

Webster Professor

■ The internationally known French physicist Pierre Aigrain has been appointed Visiting Webster Professor of Electrical Engineering at the Institute, according to an announcement by C. Richard Soderberg, '20, Dean of the School of Engineering. In announcing the appointment, Dean Soderberg said:

"Dr. Aigrain is not only considered one of the outstanding younger European scientists, but is also a world expert in theoretical and experimental phases of research on semiconductors, those materials which are giving us such revolutionary new circuit elements as transistors."

The Webster Chair was established at M.I.T. in 1952 under a grant of $400,000 from the Edwin Sibley Webster Foundation in memory of the late Mr. Webster, one of the Institute's most distinguished Alumni. While occupying the chair, Dr. Aigrain will give a series of lectures on "Modern Developments in Solid State Technology and Their Role in Communications Systems."

Edwin S. Webster, for whom the chair is named, was graduated from M.I.T. in 1888 and founded with his M.I.T. classmate, the late Charles A. Stone, the national organization of Stone and Webster, Inc., the country's first electrical engineering consulting firm.

Dr. Aigrain, who is only 32, is professor of physics at École Normale Supérieure in Paris, where he is in charge of semiconductor research. One of the youngest men ever to be appointed to such a position, he is also a member of the French Atomic Energy Commission and an adviser to SHAPE (Supreme Headquarters Allied Powers in Europe). Dr. Aigrain is in close touch also with fields of military electronics and has visited the United States several times under the auspices of the U. S. Air Force. Professor Aigrain, who came to M.I.T. during the month of May, was graduated from the French Naval Academy in 1944 and took the degrees of master of science and doctor of science at Carnegie Institute of Technology in 1946 and 1948.

Meeting No. 324

■ President Theodore T. Miller, '22, presided at the 324th meeting of the Alumni Council held at the Faculty Club on April 29, which was attended by 140 members and guests. As has been customary, the early portion of the meeting was devoted to matters of alumni business, whereas two speakers from the Institute's staff – Irwin W. Sizer, Head of the Department of Biology, and Carl F. J. Overhage, Director of Lincoln Laboratory – provided information in entertaining manner on recent developments at the Institute.

As Secretary, Donald P. Severance, '38, reported that 11 members of the M.I.T. staff or Alumni Council, between March 11 and April 27, visited local clubs, including those in London, Bombay, Monterrey, and Montreal. It was also announced that the Committee on Audit and Budget had reviewed the Treasurer's proposed budget for the coming year, which was approved by the Executive Committee. An unexpended surplus from last year's operation is to be returned to the Alumni Fund.

On the Horizon

June 10, 1957 – 23d Alumni Day, 1957, M.I.T. Campus in Cambridge.

September 6–7, 1957 – 2d Alumni Officers' Conference, M.I.T. Campus in Cambridge.

December 7, 1957 – 11th M.I.T. Alumni Regional Conference, Pittsburgh, Pa.

The results of elections of the M.I.T. Alumni Association, as recorded on page 395, were announced, and committee nominations for the coming year were submitted for vote of the Council.

As chairman of the Alumni Fund Board, Avery H. Stanton, '25, reported that, at the end of April, 10,905 Alumni had contributed a total of $451,550 to the Alumni Fund. This represents an increase of 14.6 per cent in number of Alumni contributing, and 5.6 per cent increase in amount over corresponding figures for last year. Under the direction of Joseph E. Conrad, Regional Director of the Alumni Fund, regional solicitations in 73 areas have been emphasized this year and an average of 57 per cent participation has been achieved. In half of the regions, regional chairmen have been appointed for next spring's campaign.

The Executive Committee has approved the recommendation of the Alumni Fund Board that the sum of $100,000 be allocated for M.I.T. Alumni Fund National Scholarships to be expended at a rate not exceeding $25,000 per year for the period 1957-1961, and that a sum not exceeding $35,000 be allocated for scholarships for the academic year 1957-1958 to aid those who have received Alumni Fund Scholarships in the freshman year, 1956-1957.

Plans for the Alumni Day Conference on "Today's Science—Tomorrow's Promise," as reported on page 396, were announced by Henry B. Backenstoss, '34, chairman of the Alumni Day Conference.

Professor Sizer spoke on "What's Ahead in Medical Research." Dr. Sizer's talk was well received and caused many questions to be asked. Dr. Sizer's article (page 423 of this issue) covers essentially the same subject presented before the Council and therefore his talk will not be summarized here.

For security reasons, the remarks made by Dr. Overhage are not reproduced here.

Research for High School Teachers

■ An opportunity for high school science teachers to do research of their own choosing during the coming summer at the Institute was announced in April by James M. Austin, '41, Director of the M.I.T. Summer Session. In making this announcement Dr. Austin said:

"The Westinghouse Educational Foundation has made available 24 fellowships of $800 each to be awarded to teachers selected by M.I.T. to participate in scientific research currently being conducted at the Institute. The teachers selected for the program will, in effect, join the research staffs in various departments in the School of Science at M.I.T. for an eight-week period this summer."

Individuals Noteworthy

■ Prominent in the spring news were 31 promotions, elections, or appointments as set forth below:

Philip H. Chase, '09, as Chairman of the Electrical Standards Board . . . *Philip B. Watson, '17,* as Vice-president of the Manufacturers Association of Connecticut . . . *Roy L. Johnson, '18,* as Vice-president of the National Life Insurance Company, Montpelier, Vt.;

Edwin D. Ryer, '20, as a Trustee of the Massachusetts Memorial Hospitals succeeding *George B. Glidden, '93,* retiring President of the Trustees . . . *Dana C. Huntington, '21,* as President of the Dennison Manufacturing Company . . . *Latimer F. Hickernell, '22,* as Treasurer of the American Institute of Electrical Engineers;

William M. Hoge, '22, as Chairman of the Interlake Iron Corporation, Cleveland . . . *Paul A. Heymans, '23,* as Chairman of the Vatican Section of the 1958 World's Fair, Brussels, Belgium . . . *Donald S. Cunningham, '26,* as Vice-president of Hersey Manufacturing Company;

James R. Killian, Jr., '26, as a Director of Research Corporation . . . *Samuel S. Auchincloss, '27,* as President and Chairman of Tracerlab, Inc. . . . *James A. Lyles, '27,* as a Senior Vice-president of First Boston Corporation;

Delmer S. Fahrney, '30, as Chairman of the National Investigations Committee on Aerial Phenomena, founded by citizens interested in interstellar communication . . . *Brigadier General Robert J. Fleming, Jr., '31,* as Commanding General of ADSEC, the advanced section of the European communications zone, at Verdun, France . . . *Edward B. Hubbard, '31,* as a Partner of Coffin and Burr, Boston;

Walter C. Voss, '32, as national Vice-president of Tau Beta Pi . . . *Colonel Carroll T. Newton, '33,* as District Engineer, U.S. Corps of Engineers, at Los Angeles . . . *Leburton D. Webster, '33,* as Assistant Controller of Raytheon Manufacturing Company;

Charles F. Hill, '34, as General Factory Manager of the Racine, Wisc., plant of Massey-Harris-Ferguson, Inc. . . . *John A. Hrones, '34,* as Vice-president for Academic Affairs, Case Institute of Technology . . . *Clarence D. Davis, '35,* as Associate Professor of Obstetrics and Gynecology, Yale Medical School;

Gervais W. Trichel, '35, as President of Amplex Division, Chrysler Corporation . . . *James D. McLean, '37,* as President of Hoffman Laboratories, Inc., Los Angeles . . . *Duane O. Wood, '37,* as Vice-president in Charge of Operations, Lockheed Aircraft Service, Inc.;

Louis R. Forbrich, '38, as General Manager of the Cement Division, Pittsburgh Coke and Chemical Company . . . *Hugh F. Kennison, '39,* as Vice-president in Charge of Engineering and Research, Lock Joint Pipe Company . . . *Richard L. Steiner, '39,* as Commissioner of the Federal Urban Renewal Administration;

Roy E. Nelson, '41, as Vice-president of American Gilsonite Company, Salt Lake City . . . *John E. Yocum, '44,* as Director of Technical Services for the Bay Area Air Pollution Control District, San Francisco . . . *H. Rush Spedden, '50,* as Director of Research for the Union Carbide Ore Company, a division of Union Carbide Corporation . . . *Robert H. Lucas, '51,* as Executive Vice-president of the Pittsburgh Steamship Division, United States Steel Corporation.

■ Special honors recently announced or awarded to Alumni and members of the Institute Faculty include:

To *Robert B. Sosman, '04,* the Purdy Award, by the American Ceramic Society . . . *Arthur C. Willard, '04,* honorary membership, by the American Society of Heating and Air Conditioning Engineers;

To *Erwin H. Schell, '12,* the grade of Fellow, by the American Society of Mechanical Engineers . . . *Jerome C. Hunsaker, '12,* the Distinguished Service Medal, by the National Advisory Committee for Aeronautics;

To *Raymond C. Reese, '20,* the Alfred E. Lindau Award, by the American Concrete Institute . . . *Finley B. Laverty, '25,* designated as the engineer who has done most for the civil engineering profession in Southern California during the past several years, by the Los Angeles Section of the American Society of Civil Engineers;

To *J. Frederic Walker, '25,* the 1957 Schoellkopf Medal, by the Western New York Section of the American Chemical Society . . . *James R. Killian, Jr., '26,* the Exceptional Civilian Service Award, by the Department of the Army;

To *Mrs. Edith L. R. Corliss, '41,* a Silver Medal for Meritorius Service, by the Department of Commerce . . . *T. William Lambe, '44,* a second Desmond Fitzgerald Medal, by the Boston Society of Civil Engineers . . . *José M. Bosch Aymerich, '46,* First Medal in Architecture at the Festival International d'Architecture et du Art Monumental in Paris, France;

To *Nicholas A. Milas,* Associate Professor of Organic Chemistry, an honorary doctorate of science, by Coe College;

To *C. Gardner Swain,* Associate Professor of Chemistry a $1,000 prize for outstanding investigations in theoretical chemistry, by the American Chemical Society;

To *Giorgio D. de Santillana,* Professor of the History of Philosophy and Science, *Victor F. Weisskopf,* Professor of Physics, *Kenkichi Iwasawa,* Associate Professor of Mathematics, *Erik L. Mollö-Christensen, '48,* Assistant Professor of Aeronautical Engineering, and *Gregory Tucker,* Lecturer in Music, 1957 Fellowship Awards, by the John Simon Guggenheim Foundation.

■ Among the Alumni to whom birthday congratulations are appropriate during this month are two due to celebrate 90th anniversaries, two their 85th, and two their 80th, namely:

Born in June, 1867 – *Miss Ada M. Fitts, '96,* on the 4th; and *David S. Hawkins, '92,* on the 24th;

Born in June, 1872 – *Frank L. Harlowe, '96,* on the 3d; and *Dorville Libby, Jr., '95,* on the 24th;

Born in June 1877 – *Herbert R. Stearns, '00,* on the 17th; and *Harry M. Harps, '00,* on the 19th;

With these six, the rolls of the Alumni Association will include a total of 53 living nonagenarians and 593 octogenarians.

Twenty-five Years Ago This Month . . .

■ On June 7,1932, commencement exercises at Symphony Hall marked the graduation of the Institute's 65th class. Of the total of 697 degrees then awarded, 461 went to bachelors of the Class of 1932 and 236 to candidates for advanced degrees, namely: 15 doctorates of philosophy and 12 of science, 204 masters of science and 5 masters in architecture.

The academic procession was led by Alexander Macomber, '07, who four years earlier had been the Alumni Association's 35th President; and next, heading the group of distinguished guests of honor, came Karl T. Compton, President, escorting the commencement speaker, who was Sir Henry Thornton, President of the Canadian National Railways.

Then, in order, followed Corporation members marshaled by Walter Humphreys, '97 (the 9th Secretary of the Alumni Association, from 1907 to 1923); members of the 50-year Class of 1882 marshaled by Dean Samuel C. Prescott, '94 (the 34th President of the Alumni Association, in 1927-1928); and members of the Faculty marshaled by Professor George E. Russell, '00.

Finally, came the long procession of degree candidates led by Donald B. Gilman, President of the Class of 1932, and its three elected marshals: William H. Barker, John Lawrence, and Thomas B. Rhines – which four, respectively, are in 1957: Factory Manager, Electric Regulator Company, Norwalk, Conn.; Sales Supervisor, Apex Tire and Rubber Company, Pawtucket, R.I.; President, Joy Manufacturing Company, Pittsburgh, Pa.; and Assistant Chief Engineer, Hamilton Standard Division, United Aircraft Corporation, Hartford, Conn.

Mr. Sloan . . . at the time of his election to life membership on the Corporation

. . . Alfred P. Sloan, Jr., '95, was elected a life member of the Institute Corporation, of which he had been an alumni term member during 1926-1931.

Visiting Committee Report on Physics

■ Members of the Faculty of the Department of Physics met with members of the Visiting Committee on this Department on April 6, 1956.* During this meeting the undergraduate, graduate, and research programs of the Department were carefully reviewed.

In recent years the traditional approach to physics teaching has not been as successful in giving the undergraduate an adequate perspective of modern physics and its new philosophies as is desirable. In an effort to meet current educational needs more effectively, the Department is attempting to compress and integrate the presentation of classical physics with modern physics and its concepts. An aim of the new program is to present, in two years of undergraduate study, a much larger view and understanding of modern physics than has previously been possible.

The Committee feels that the Department is making good progress in its new experimental teaching program. The students are responding with enthusiasm to the new approach, and the number of failures is surprisingly small. The Committee urged the Department to publish its new material in textbook form at the earliest opportunity so that other universities may take advantage of the Department's pioneering work.

The modernization of undergraduate teaching has extended into the laboratory as well as the classroom. The traditional routine experiments of undergraduate physics have been abandoned, new experiments with challenging interest have been developed and, in spite of the large number of students serviced, a lively laboratory experience is provided. This effort is to be commended and encouraged. The new enthusiastic teaching program is being carried on without detriment to the Department's program of research.

The upward trend of the past few years in number of freshmen electing physics, if continued, will present a major problem in space, facilities, and teaching staff for the Department. One hundred and five freshmen selected physics as a major in 1952, and 180 selected it in 1955. Even should the number of freshmen choosing physics stabilize at this level, within a few years the number of students registered in physics will overtax the Department's space, facilities, and Faculty even with the new Karl Taylor Compton Laboratories. The total, including graduate students, in the Department is now 591. Even with a leveling off in freshman input, the number will approach 900 in a few years.

When completed, the Compton Laboratories will provide more effective and improved housing for physics instruction and research, but it will add little to the capacity of the Department. Within the next few years, therefore, major problems in providing space, facilities, and instructing staff to meet the Department's growing needs and responsibilities, will develop.

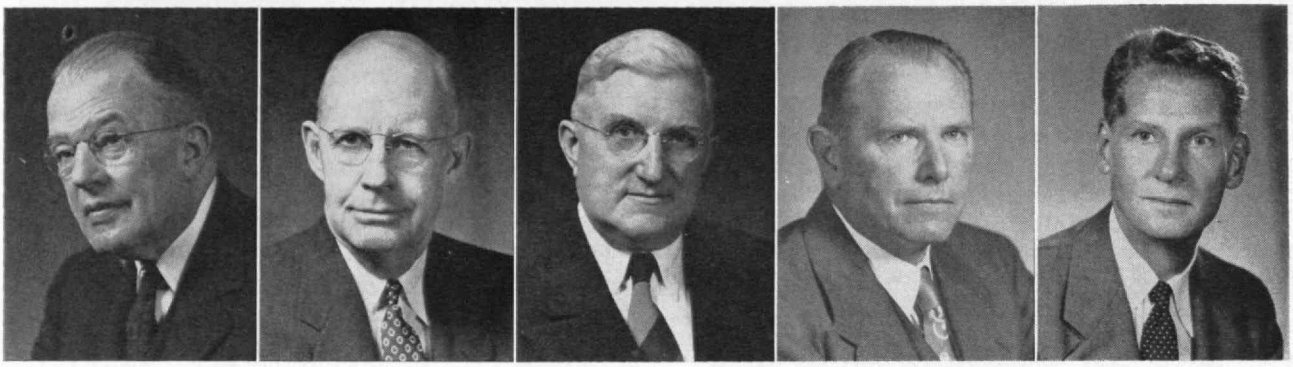
The Committee was most favorably impressed with the teaching and research activities of the Department. The Committee's only recommendation is that a sound estimate of student population of the Department for the next several years be made and that space, facilities, and Faculty requirements for the expanding student body be planned for as early as possible to insure that the high quality of the work of the Department not suffer from overcrowding, shortage of facilities, and overloading of Faculty.

After review by the Corporation and Executive Committee of the Institute, the Committee's report of April 6 was received for publication in The Review last October 25.

* Members of this Committee for 1955-1956 were: Mervin J. Kelly, chairman, H. B. Richmond, '14, Robert B. Lindsay, '24, Henry A. Morss, Jr., '34, Leonard I. Schiff, '37, Edwin H. Land, Alfred L. Loomis, I. I. Rabi, and C. Guy Suits.

M.I.T. Photos

A. A. Ashdown, '24 E. L. Cochrane, '20 A. R. Davis W. C. Eberhard, '14 W. H. McAdams, '17



G. Scatchard W. E. Stanley A. L. Townsend, '13 C. M. Wareham, '16 W. L. Whitehead, '13

To Other Assignments

■ Nine members of the Institute's Faculty and two members of the M.I.T. Administration will retire effective July 1. Portraits of the 11 appear on these two facing pages.

Avery A. Ashdown, '24, will continue to serve as secretary of the Society of Arts and as master of the Graduate House following his retirement as Associate Professor of Organic Chemistry. In 1956 a portrait of Dr. Ashdown was presented to the Graduate House by former residents of the House in appreciation of his friendship and guidance during the years he has served as master there.

Edward L. Cochrane, '20, Vice-president for Industrial and Governmental Relations, has also served as head of Course XIII and as Dean of the School of Engineering. Additional data regarding Admiral Cochrane appear on page 396.

Arthur R. Davis, Associate Professor of Inorganic Chemistry, a member of the Institute's Department of Chemistry since 1930 has had wide experience in scientific and educational fields. He received the B.A. degree from Wesleyan University (1915) and the M.A., and Ph.D. degrees from Harvard University (1925 and 1930). He was a member of the staff and acting head of the Department of Chemistry at Middlebury College and also taught chemistry at Harvard University.

Walter C. Eberhard, '14, Assistant Professor of Engineering Graphics, has been associated with the Institute's engineering drawing and graphics program for 38 years. He served as assistant in Civil Engineering for two years, left the Institute between 1916 and 1919 when he returned as instructor in graphics. From 1923 to 1933 Professor Eberhard was director of the M.I.T. Mining Camp in Dover, N. J.

William H. McAdams, '17, Professor of Chemical Engineering, received the B.S., M.S., and honorary D.Sc. degrees from the State University of Kentucky (1913, 1914, and 1945), and the S.M. degree from M.I.T. (1917). For his work in heat transmission, Dr. McAdams received the Worcester Reed Warner Medal of the American Society of Mechanical Engineers in 1954.

George Scatchard, Professor of Physical Chemistry, elected to membership in the National Academy of Sciences in 1946, received the B.A. degree from Amherst College (1913) and the Ph.D. from Columbia University (1917). In 1954 the Northeastern Section of the American Chemical Society awarded him the biennial Theodore William Richards Medal for his work on the physical chemistry of solutions. During World War II he was scientific adviser to the Deputy Military Governor in Germany.

William E. Stanley, Professor of Sanitary Engineering, with degrees from Kansas State College and Purdue University (1912 and 1916) came to M.I.T. in 1944 after a varied and active career in government and industrial service. For five years prior to World War II he was professor of sanitary engineering at Cornell University, and from 1941 to 1944 served as a major in the Corps of Engineers.

Arthur L. Townsend, '13, received the S.B. degree from M.I.T. (1913) and served as supervisor engineer of the Massachusetts Bonding and Insurance Company before joining the M.I.T. Faculty in 1919. He has served for many years as undergraduate and alumni placement officer for his Department where he is associate professor of mechanical engineering. He is director of the Lowell Institute School — a post he will continue to hold. Professor Townsend is a

former vice-president of the M.I.T. Alumni Association (1937–1939) and has been a member of many alumni committees.

Charles M. Wareham, '16, Associate Professor of Inorganic Chemistry, received the S.B. degree from M.I.T. (1916) and has been a member of the Institute's staff for 41 years. He joined the staff as assistant in drawing and descriptive geometry immediately upon graduation, and the following year became an instructor in the chemistry of sanitation. In 1935 he was appointed assistant professor, and in 1941 became associate professor of inorganic chemistry.

Walter L. Whitehead, '13, Associate Professor of Geology, received the S.B. and Ph.D. degrees from M.I.T. (1913 and 1917). He worked as consulting geologist and mining engineer in various parts of the world and joined the Department of Geology in 1928 as lecturer. He became assistant professor in 1942 and associate professor in 1947. He will direct the M.I.T. Summer Camp at Antigonish, N.S., as he has since it was organized in 1948.

William Emerson: 1873–1957

■ The death at his Cambridge home on May 4 of Professor William Emerson, Dean Emeritus of M.I.T.'s School of Architecture and life member of the Corporation, has been noted by The Review with regret. He was 83 years old.

After a distinguished career as practicing architect in New York City, where he became noted for his design of model tenement houses and bank buildings, Dr. Emerson came to M.I.T. in 1919 to begin 20 years' active service as professor, head of the Department of Architecture, and dean. He was elected a life member of the Corporation in 1939.

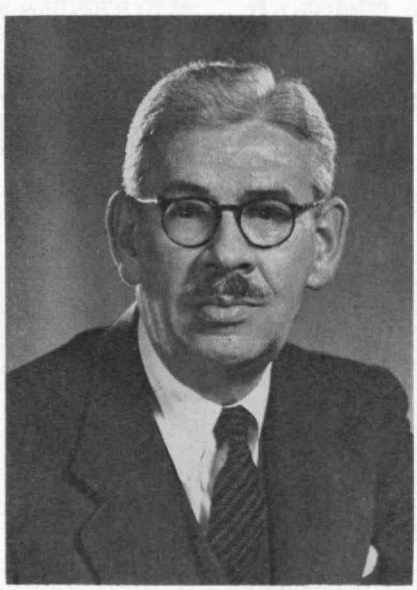
Dr. Emerson was graduated from Harvard in 1895 and studied architecture at Columbia University and at L'Ecoles de Beaux Arts in Paris. During World War I he served in France as director of the American Red Cross Bureau of Construction, and was awarded the ribbon of Chevalier of the Legion of Honor.

Widely known for his contributions to architectural education as chairman of the Educational Committee of the American Institute of Architects, Dr. Emerson had for many years also been an active leader in numerous architectural societies. He was formerly an advisory architect for Radcliffe College, chairman of the Unitarian Service Committee, chairman of the Corporation of Simmons College, and president of the Civic Association for the United Nations. He was an honorary member of Phi Beta Kappa at Harvard and was awarded an honorary doctorate in 1939.

Time to Refire

■ Thirty-two years ago next month The Review published a three-page, fact-filled article entitled "Shoes and Ships and Sealing Wax" in which "a new and welcome Review contributor gives his impressions of 'The Day at the Institute.'" The author was J. J. Rowlands, whose name has regularly appeared on The Review's masthead for the past third of a century. Sometimes Mr. Rowlands was listed as contributing editor, sometimes as editorial associate, sometimes as consultant. But whatever the title, he was always regarded as a "perennial friend of The Review," and a competent and sympathetic counselor to its editors. He was made an honorary member of the M.I.T. Alumni Association in 1955 and, upon taking leave of absence last year, became consultant to The Review. On July 1, Mr. Rowlands joins the ranks of those who attain emeritus status.

Born in Aberdeen, N. C., on June 19, 1892, Mr. Rowlands received his education in military academies in the United States and in higher institutions of learning in Toronto. He engaged in surveying and field engineering in Canada for several years before turning to editorial work for the Springfield (Mass.) *Union*. He was assistant news editor and, subsequently, New England and Eastern Canadian Manager for the United Press Association between 1916 and 1923. He was managing editor of *National Sportsman* from 1923 until he joined the Institute staff on February 9, 1925, as Director of the M.I.T. News Service.



M.I.T. Photo

John J. Rowlands

At present, the news and public relations activities of the Institute are conducted by a staff of five men and eight women. But for two decades – including the active period during World War II – the M.I.T. News Service activities were the sole responsibility of John J. Rowlands. The esteem with which his professional work is regarded can best be ascertained from the remarks of a competent and disinterested observer. In the Boston *Herald* of Saturday, February 18, 1950, Edward A. Weeks, Editor of *The Atlantic Monthly*, wrote: "In my judgment, the best public relations in the college world over the past 25 years have been those maintained by James Rowlands at the Massachusetts Institute of Technology."

Mr. Rowlands is author of *Cache Lake Country; Life in the North Woods*, and published a monthly news letter, *Cache Lake Letter*, from 1946 to 1949. He is author of articles in *The Atlantic Monthly, Boys' Life*, The Technology Review, and several sports magazines.

Mr. Rowlands has just completed a new home in Cohasset, and currently he is engaged in writing a sequel to his *Cache Lake* book and has other writing objectives as well. Thus, he has by no means signed "30" to his last piece of copy; he is merely taking time out to refire.

M.I.T. Photos

W. Ambrose | R. L. Bishop | J. M. Blum | B. T. Feld | R. J. Hansen, '48

Promotions

■ The 10 young men whose portraits appear on this page have been promoted to full professorship, 14 others have been advanced to associate professorship, and 15 more have been advanced from instructor to assistant professor. Sixteen Faculty promotions were in the School of Engineering, 15 in the School of Science, 5 in the School of Humanities and Social Studies, and 3 in the School of Industrial Management. All promotions are effective on July 1.

The 10 reaching the top of the academic ladder this year are: Warren Ambrose, Department of Mathematics; Robert L. Bishop, Department of Economics; John M. Blum, Department of Humanities; Bernard T. Feld, Department of Physics; Robert J. Hansen '48, Department of Civil and Sanitary Engineering; Harold S. Mickley, '46, Department of Chemical Engineering; René H. Miller, Department of Aeronautical Engineering; Walter A. Rosenblith, Department of Electrical Engineering; George W. Whitehead, Department of Mathematics; and William A. Wilson, Department of Mechanical Engineering.

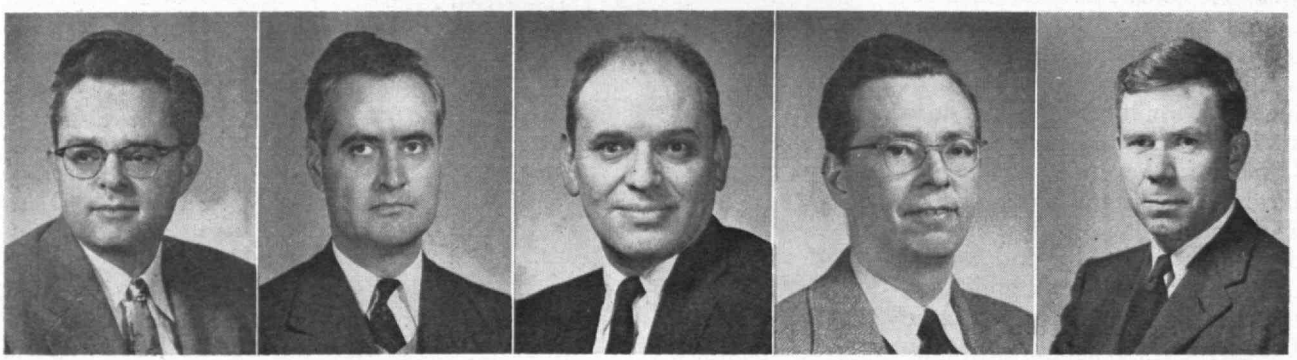
The following 14 men have been promoted to associate professor: Nesmith C. Ankeny, Department of Mathematics; Walter A. Backofen, '46, Department of Metallurgy; Raymond F. Baddour, '49, Department of Chemical Engineering; William H. Dennen, '42, Department of Geology; David A. Huffman, '53, Department of Electrical Engineering; Thomas B. King, Department of Metallurgy; William L. Kraushaar, Department of Physics; Leo B. Moore, '37, School of Industrial Management; John F. Nash, Department of Mathematics; Norman A. Phillips, Department of Meteorology; Lucian W. Pye, Department of Economics and Social Science; Robert R. Rathbone, Department of Humanities; J. Lowen Shearer, '50, Department of Mechanical Engineering; and Kenneth N. Stevens, '52, Department of Electrical Engineering.

The 15 men listed as follows have been promoted to assistant professor: Walter F. Cannon, Department of Humanities; Stanley E. Charm, '57, Department of Food Technology; F. Albert Cotton, Department of Chemistry; George J. Fuld, '53, Department of Food Technology; Brison D. Gooch, Department of Humanities; S. William Gouse, '53, Department of Mechanical Engineering; Edward Herbert, Department of Biology; Norman H. Meyers, '54, Department of Electrical Engineering; William R. Moore, Department of Chemistry; Roger W. Prouty, Department of Humanities; James E. Roberts, '51, Department of Civil and Sanitary Engineering; Robert A. Schluter, Department of Physics; Campbell L. Searle, '51, and Richard D. Thornton, '54, both of the Department of Electrical Engineering; and Nathan S. Wall, '54, of the Department of Physics.

Bohr to be Compton Lecturer

■ Niels Bohr, Danish physicist, will be in residence at the Institute for a month next fall as Karl Taylor Compton Lecturer. Announcement that Dr. Bohr had accepted appointment to the lectureship was made on May 8 by James R. Killian, Jr., '26, President. It was announced previously that Dr. Bohr would come to Washington, D.C., late in October to receive the $75,000 Atoms for Peace Award.

Dr. Bohr will be the first to hold the Compton Lectureship which has been established in honor of the late Karl Taylor Compton, former M.I.T. President and Chairman of the Corporation.



H. S. Mickley, '46 | R. H. Miller | W. A. Rosenblith | G. W. Whitehead | W. A. Wilson

School of Industrial Management Holds Convocation

After five years of operation the newest M.I.T. school surveys its accomplishments in education for management

A TECHNOLOGY REVIEW REPORT

In celebration of the fifth anniversary of the founding of the School of Industrial Management at the Institute, a convocation emphasizing the education of a new kind of industrial leader was held at M.I.T. on Tuesday, April 9. Some 500 leaders of business and industry from all parts of the country, as well as M.I.T. representatives (especially from the School of Industrial Management), attended this eventful occasion in Cambridge.

The morning session opened at 10:00 A.M. in Kresge Auditorium with E. P. Brooks, '17, Dean of the School of Industrial Management, presiding. The morning program included addresses on: "Tomorrow's Industrial Leadership" by Dean Brooks; on "Systems Technology and Industrial Dynamics" by Jay W. Forrester, 6–45, Professor of Industrial Management and formerly Head of the Computer Division of Lincoln Laboratory; and on "The Human Side of Enterprise" by Douglas M. McGregor, Professor of Industrial Management.

At the catered luncheon, served in Rockwell Cage adjacent to the Kresge Auditorium, Julius A. Stratton, '23, Chancellor of M.I.T., presided. Following the luncheon, Eli Shapiro, Associate Dean of the School of Industrial Management and Professor of Finance, spoke on "Financial Forces in Industrial Growth."

The afternoon session, in Kresge Auditorium, was devoted to a panel discussion on "The Evolving Role of the Corporate Director" with Lyman Bryson, radio moderator, as chairman. Members of the panel were Vannevar Bush, '16, Chairman of the M.I.T. Corporation and formerly president of the Carnegie Institution of Washington; Eugene V. Rostow, Dean of the Law School of Yale University; David A. Shepard, '26, a Director of the Standard Oil Company (New Jersey); and Sidney J. Weinberg, Senior Partner of Goldman, Sachs and Company.

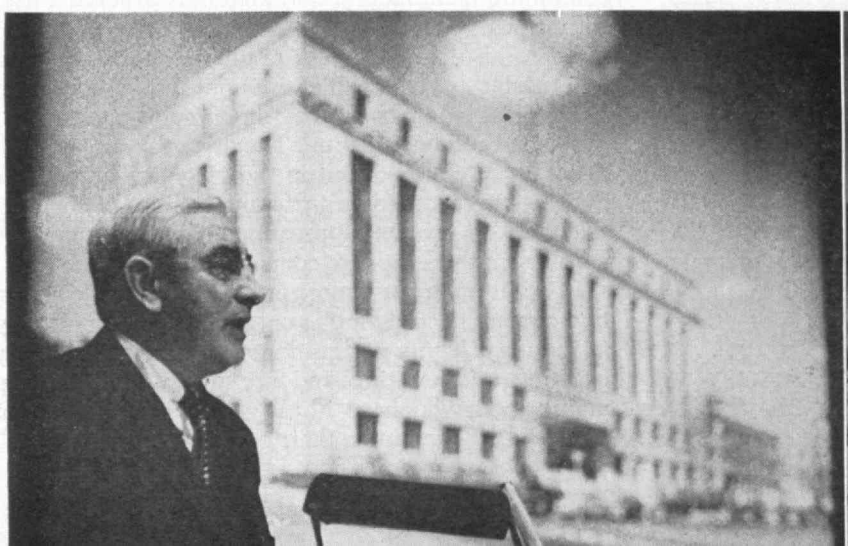
Dinner in the evening was at the Hotel Sheraton Plaza in Boston. James R. Killian, Jr., '26, President of M.I.T., presided at the dinner at which Alfred P. Sloan, Jr., '95, former president and Honorary Chairman of the Board, General Motors Corporation, was guest of honor. Cleo F. Craig, Chairman of the Board, American Telephone and Telegraph Company, gave the principal address entitled "Tomorrow's Managers."

Morning Session

The morning session was opened at 10:00 A.M. by Dean Brooks, who was the first graduate of Course XV. After welcoming his guests to the convocation and commenting on the splendid attendance, Dean Brooks reviewed the history of the School of Industrial Management in an address entitled "Tomorrow's Industrial Leadership." He recalled that the School was the co-operative result of the work of a great industrialist and of a great educator – Alfred P. Sloan, Jr., '95, and Karl T. Compton, respectively. These men foresaw the need for a new kind of education,

E. P. Brooks, '17, first graduate of Course XV and now Dean of the School of Industrial Management (left), *opens the convocation. Alfred P. Sloan, Jr., '95 (whose realistic appraisal of American educational needs helped found the School), discusses the convocation program with Robert M. Kimball, '33, Secretary of the Institute.*

M.I.T. Photos



Douglas M. McGregor, Professor of Industrial Management, speaks on "The Human Side of Enterprise."

following in the tradition of Western culture, to help meet the needs of a vast and rapidly growing industrial and technological society.

New conditions, Dean Brooks reported, call for a new kind of education, and efforts are being made at M.I.T. to provide such education for tomorrow's leaders in business and industry. It is clear that executives need to have a good knowledge of science and engineering and will need powers and methods of analysis vastly superior to those which were available to them in the past. History has shown – and many M.I.T. graduates have demonstrated – that the discipline of science and engineering provides a sound basis for executive development. It seems logical, therefore, for future executives to obtain their early education and academic training in an environment in which engineering and science – along with architecture – play the major role.

It is from this point of view that the M.I.T. School of Industrial Management was opened in the fall of 1952. The School was made possible by Mr. Sloan's faith in the need for developing executives who understand engineering and science, by the support he gave in financing the School's first years of operation, and by purchase of the Sloan Building for the School.

General view in the lobby of the Kresge Auditorium, as guests registered for a full day of convocation activities.

What, one may ask, is the general objective of the School for Industrial Management, and wherein does it differ from other business schools? The School has adopted, as guiding principle, the following aims:

1. Education for general management – rather than for specialized staff functions – is its goal.

2. The executive leader needs to know the nature of man as well as technical operations, and hence topics in the social sciences – such as psychology, sociology, history, labor relations and communication – are emphasized in training its students.

3. It is recognized that no school can teach a man all he needs to know, that much of his knowledge and usefulness will come from experience gained in industry. For this reason, there is a division of work between industry and the university in training students in the School of Industrial Management. At the university, the student should learn the methods of analysis; in industry, he has his best opportunity to become acquainted with modern industrial practice.

4. Education can thrive only in an atmosphere charged with the excitement of research and discovery. Hence, the future executive must know how to use the new techniques that are becoming available for the handling of facts.

5. Finally, it is important to recognize what can be done in an educational institution and what cannot be done. How, for example, can the student be taught boldness, initiative, judgment, sense of proper timing, and, most important of all, character? If such topics can be taught at all, they can be taught most effectively by example through contact with recognized leaders in these areas of human conduct.

With such aims, the School was established in 1952. Where do we stand at the present time?

The School of Industrial Management now conducts four educational programs. At least two – the undergraduate and graduate programs – follow traditional university effort; the other two represent bold ventures in a new and important area of advanced training for mature executives of proven ability.

The undergraduate program of the School, leading to a bachelor's degree, is not exactly new and had its genesis in Course XV, established by Erwin H. Schell, '12, Professor of Industrial Management, Emeritus, prior to World War I. Students in Course XV spend 75 per cent of their time studying engineering or science topics and the remaining 25 per cent is devoted to topics dealing with business functions – in combining men, money, and materials to serve a useful purpose.

There also is a two-year graduate course, leading to a master's degree, which was put into operation in 1952. This, too, is based largely on good background in science and engineering. The first year subjects are generally prescribed, but in the second year the student has great freedom to follow courses of his own selection. At present, approximately 100 students are enrolled in this graduate course of studies.

In addition to these more or less traditional courses, two courses of study are in operation for men already in industry. These postgraduate programs are highly exacting and exciting and are given to promising young men who have already shown indication of potential leadership in their companies.

The convocation luncheon was held in the Rockwell Cage. Head table guests shown here, from left to right are: (1) Howard W. Johnson, Associate Professor of Industrial Management; (2) William F. Massey, President of the Graduate Management Society; (3) Ralph E. Freeman, Professor of Economics and Head of the Department of Economics and Social Science; (4) John T. Norton, '18, Chairman of the Faculty; (5) C. Richard Soderberg, '20, Dean of the School of Engineering; (6) E. P. Brooks, '17, Dean of the School of Industrial Management; (7) J. A. Stratton, '23, Chancellor of M.I.T.; (8) Eli Shapiro, Associate Dean of the School of Industrial Management (hidden by lectern); (9) George R. Harrison, Dean of the School of Science; (10) John E. Burchard, '23, Dean of the School of Humanities and Social Studies; (11) Thomas M. Hill, Associate Professor of Industrial Management; (12) Gary J. Dischel, '57, President of the M.I.T. Management Society; and (13) W. Van Alan Clark, Jr., '42, Assistant Dean of the School of Industrial Management.

The first of these is the Sloan Fellowship Program for men in their early to mid-thirties. Such men come to study at M.I.T. for a year, with their families, during which time they have a leave of absence from their companies.

The second course, started in 1956, is intended for about 20 men of 40 to 50 years of age who spend 10 weeks in further study to advance their executive ability.

The Institute's executive training programs have now passed beyond the experimental stage. Industry is coming to realize that only by coming back to class can modern executives keep fully abreast of the great and rapid surge of learning that is being generated. The military services have already recognized this need and send their officers back to service and command schools with the War College at the top. At the School of Industrial Management, Dean Brooks felt, M.I.T. is establishing a sort of War College with emphasis on the training of leaders for industry and technological leadership, rather than for leadership in the arts of war. As evidence of the success of this type of program, Dean Brooks cited the fact that industry is turning more and more to colleges to provide the necessary leadership.

Dean Brooks then introduced Professor Forrester, who spoke on "Systems Technology and Industrial Dynamics." Professor Forrester's address may be found on page 417.

The Human Side of Enterprise

As the last speaker at the morning session, Douglas M. McGregor, Professor of Industrial Management, spoke on "The Human Side of Enterprise." It was Dr. McGregor's belief that, in the next quarter century, major developments will be made in the social sciences. So far, this is a pious hope to which we can look forward with great anticipation, but there is little else to go by at the moment.

The present view is that management's task is: (1) to organize men, money, materials, and machines to a useful economic end result; (2) to provide effective motivation to get things done by people engaged in the business enterprise; (3) to recognize that, without motivation, people are passive, so that the urge to drive is a task of management. Behind this conventional theory of management's role is the general belief that, when left to himself, man is indolent, self-centered, gullible, resistant to change, will do only the minimum amount of necessary work, and needs to be spurred to action because he usually lacks initiative. Our present managerial efforts fully reflect these attitudes. In its efforts to accomplish its task, management sometimes goes to the "soft" or the "hard" extreme.

The most important things for management to recognize are the factors affecting personal motivation. As soon as one of man's needs is filled, another appears to take its place. These needs appear in a well-established order, beginning with the most basic, and leading progressively to the most complex.

Our most basic needs are for food, clothing, and shelter, but once these physiological needs are satisfied, man strives to fill other needs and is motivated toward this end. A satisfied need is not, therefore, a motivator of behavior, nor does it make for a movement toward change or betterment.

After man's basic needs are satisfied, his need for safety assumes major importance; some call this a need for security. But Dr. McGregor believes this is incorrect; man looks for the "fairest break possible" in the treatment he receives, rather than for security as such. He recognizes there is no complete security in an absolute sense, but wants to stand on an equal and fair footing with his fellow man.

After the safety needs are satisfied – and they can be now in our modern technological society – social needs come to the fore. We recognize the need for acceptance by our associates, for recognition, for praise, for being accepted by the group, for "belonging."

Beyond the social needs come the egoistic needs; these are of greatest importance to management.

These needs are for: (1) self-esteem (self-confidence, independence, achievement, competence and knowledge of one's job, and so on); and (2) reputation (appreciation, status, and respect with which a person is held by his colleagues). The typical organization offers very little opportunity to advance the ego needs of its employees.

Above the ego needs are those for self-actuation, for self-development, for creativeness in the broadest sense of the word. Even less opportunity to fulfill these needs is provided by modern management today.

Professor McGregor stated that deprivation of any of the above human needs has behavioral consequences, and a person frustrated in satisfying motivation needs may be considered as being "sick." If we accept this new concept, we open the door to new areas of research and potential success in the social sciences. We must recognize that man is motivated only to put forth effort to satisfy the next higher need on the scale outlined above.

Failure to recognize that the same means of gratifying personal needs is not equally effective for motivating all persons has deprived management itself of motivation by direction and control; management has been offering motivations which are ineffective and which are irrelevant for the needs to be satisfied. That is, management by direction and control fails to provide proper motivation. A new theory proposed by McGregor holds that:

(1) Management is responsible for organizing elements of the productive enterprise in the interest of economic ends;

(2) People are not by nature passive but become so through conditioning due to their environment;

(3) The abilities and desires present in everyone can be brought to the fore and developed by management;

(4) The essential task of management is to arrange organizational conditions so that people can attain their own goals through individual growth and advancement. Progress with this theory depends for its success upon management by attainment of desired objectives.

Professor McGregor recognized that the elements of his new theory need much experience and experimentation before it is possible to take full advantage of his concepts. Yet, there is hope that in the next quarter century, we can make progress in satisfying the higher goals now that the more basic ones have been reached.

Luncheon

Upon conclusion of these addresses, the audience moved from Kresge Auditorium to the Rockwell Cage where a catered luncheon was served at tables seating about 10 people each. So far as possible, a senior Faculty member of the School of Industrial Management, or a Sloan Fellow, mixed with the guests at each of the tables.

Upon conclusion of the luncheon, Chancellor Stratton spoke briefly on the significance of the work being done in the School of Industrial Management. He pointed out that government, as well as industry, will make increasing demands on those who are well trained in economics as well as in science. In speaking of the educational program of the School of Industrial Management, he indicated that its work reflects the character of M.I.T. The convocation is devoted to the problems of management, and the School of Industrial Management enjoys the respect and support of the Institute. It aims, as does M.I.T., to keep standards high, to attract excellent students through assembling an outstanding Faculty.

This thought provided opportunity to introduce those at the head table, which included: C. Richard Soderberg, '20, Dean of the School of Engineering; George R. Harrison, Dean of the School of Science; John E. Burchard, '23, Dean of the School of Humanities and Social Studies; E. P. Brooks, '17, Dean of the School of Industrial Management; J. A. Stratton, '23, Chancellor; Eli Shapiro, Associate Dean of the School of Industrial Management; Professor John T. Norton, '18, Chairman of the Faculty; Professor Ralph E. Freeman, Head of the Department of Economics; Howard W. Johnson, Associate Professor of Industrial Management; Thomas M. Hill, Associate Professor of Industrial Management; Gary J. Dischel, '57, President of the M.I.T. Management Society, Undergraduate Student Association; William F. Massy, President of the Graduate Management Society of the School of Industrial Management; and W. Van Alan Clark, Jr., '42, Assistant Dean of the School of Industrial Management.

Chancellor Stratton then introduced Eli Shapiro, Associate Dean of the School of Industrial Management (who will be on leave of absence for the next year on studies of his own), who spoke to those attending the convocation on the topic, "Financial Forces in Industrial Growth," as on page 412.

The Corporate Director

Following luncheon, the convocation resumed with the afternoon session in Kresge Auditorium devoted to a panel discussion of "The Evolving Role of the Corporate Director." Panel members were Sidney J. Weinberg, Senior Partner of Goldman, Sachs and Company; Eugene V. Rostow, Dean of the Law School of Yale University; David A. Shepard, '26, Director of the Standard Oil Company (New Jersey); and Vannevar Bush, '16, former President of the Carnegie Institution of Washington and now Chairman of the Corporation of M.I.T. Moderator of this panel was Lyman Bryson, whose radio program "Invitation to Learning" is known to most Americans.

Mr. Weinberg started the discussion by presenting his views on the role of the corporation director. In Mr. Weinberg's opinion, the role of the director does not change much, rather it is the corporation itself that undergoes change. A board of directors usually has inside directors selected from the executives running the company and outside directors who are not on the company payroll. Mr. Weinberg thought that corporations should have a majority of outside directors. The purpose of the board is to act as a buffer between the company and the outside world, to represent all the stockholders, but to consider as well the interests of the country, the community, and the

public. A corporation member has power only during a corporation meeting, and then in an advisory capacity; it is up to the officers of the company to put policies into effect and to manage the company. A board of from 12 to 15 members appears to be of optimum size.

Mr. Weinberg felt that directors should be selected for the breadth of their knowledge and experience. Obviously, they would be mature, older men. But inside directors should not be older than 65 years, and outside directors not older than 70 if they are to perform effectively.

Directors must be equipped with the tools to advise company executives, and these must be supplied by the company officers. Regular board meetings should be held each month; there should be an agenda prepared well in advance; minutes of the previous meeting should be circulated regularly and promptly; counsel should be represented at all board meetings to avoid possible legal entanglements; and directors should receive all pertinent information regarding company activities, policies, and plans to enable directors to do their work well; they should receive copies of all important financial reports.

Directors should have opportunity to meet with younger, able company executives in order that they may know who the company leaders are. An important function of board members is selection of a new chief executive and this can be aided if board members are acquainted with potential candidates from within the company's personnel.

The board member often serves on committees; sometimes he makes his major contributions through such service. Frequently, he has to take reports and financial records home with him for evening study. Finally, the director must have a keen social sense and he must be aware of the human problems of business which are involved.

Dean Rostow spoke next and pointed out that the corporation was only one of a great many institutions of modern society, but that it was regulated in a way different from other social institutions. Churches, labor unions, and educational institutions are other examples of social institutions which are relatively free from legal restrictions, except in a broad sense.

It is well to recognize the directors as trustees who operate under certain statutes. Dean Rostow then

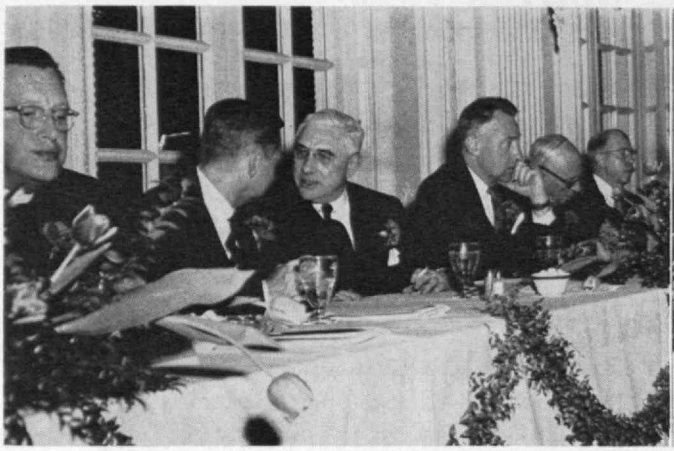
asked, "For whom and for what do board members operate?" Dean Rostow expressed the view that so long as directors acted on behalf of the economic interests of stockholders, they were performing in an orderly, well-recognized, and well-established manner. But as soon as they pretend to act in the public interest, there will be others – including politicians – whose claim to act in the public interest is also to be taken into account, and there may be conflict of interests and authority.

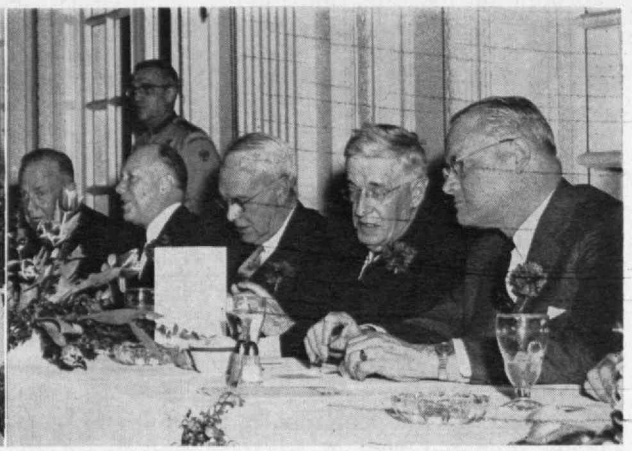
Mr. Shepard stated that all of the directors of his firm are inside directors; there are no outside directors, and yet the company operates many companies and offices in all parts of the world. Mr. Shepard pointed out that a holding company provides counsel and co-ordination of individual companies in an effective way, that the directors assure appointment of the best managers and officers, and that they are effective in aiding research progress.

While agreeing that the responsibility of the directors is to provide that the stockholders are adequately represented in the able management of their business, Mr. Shepard held that the raw material – oil in the case under consideration – makes it necessary for directors to do more than look at the stockholders' interests. The corporation must be regarded not only as efficient and profitable in its operations, it must also be regarded as a good citizen in the community. Mr. Shepard pointed out that the company could not thrive in the long run, no matter how much money its stockholders made, if its operations and activities ran counter to the public interest.

▲ *As shown in the illustration at the top of this page, the afternoon session was given to a panel discussion of "The Evolving Role of the Corporate Director." Members of this panel were (left to right): Sidney J. Weinberg, Eugene V. Rostow, Lyman Bryson, who was chairman, David A. Shepard, '26, and Vannevar Bush, '16.*

◄ *At left, James R. Killian,Jr., '26, President of the Institute, speaking at the dinner at the Hotel Sheraton Plaza, appears to have amused his listeners. Other head table honored guests (left to right) included: Cleo F. Craig, J. A. Stratton, '23, and Andrew T. Kearney.*





Honored guests at the head table at the banquet included (left to right): The Reverend Theodore P. Ferris, Rector of Trinity Church; Joseph J. Snyder, 2–44, Treasurer of M.I.T.; E. P. Brooks, '17, Dean of the School of Industrial Management; Wayne J. Holman,Jr., President, Chicopee Mills, Inc.; Alfred P. Sloan, Jr., '95, honorary chairman of Board of General Motors Corporation; and President Killian. In the right-hand illustration, honored guests (left to right) include: Cleo F. Craig, Chairman of Board, American Telephone and Telegraph Company, who gave the main banquet address: J. A. Stratton, '23, M.I.T. Chancellor; Andrew T. Kearney, Partner, A. T. Kearney and Company; Vannevar Bush, '16, Chairman of the M.I.T. Corporation; and Frederick R. Kappel, President of American Telephone and Telegraph Company.

As final speaker on the panel, Dr. Bush stated his view that there is great need for a chief executive to report to and to receive sound advice from someone in operating his plant. A group is needed to review, criticize, and guide the long-range operations of the executives whose responsibility is for the day-to-day operations and management of the firm. The board should support the company executives in their operating activities; if they cannot do this and have lost faith in their chief executive, a new president should be found. It is not sound to leave the company affairs in the hands of any individual or any small group for any length of time without review by some appropriately named agency.

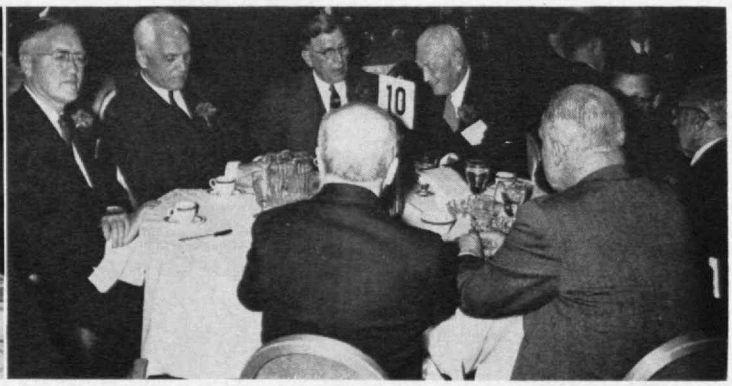
The board must be constituted so that it can select the chief executive for the firm. The chairman of the board should not be the company's chief executive. "If this is so, then what does the chairman of the board do?" asked Dr. Bush.

One of the important roles of a board chairman is to look to it that the board is of proper composition to give most effective advice to the firm's executives. Age is no factor in this regard; in fact, the older a person gets, the more experience he accumulates and – barring ill health – the more valuable he becomes. The chairman of the board can further outside relationships for the company without being too much involved in its daily operations. The board should be composed of able, experienced men of independent thoughts; it should not be a rubber stamp congress.

Where do we get good board members, Dr. Bush asked? Why do men serve on boards? Certainly they get negligible monetary compensation from such service. Men work for pride and satisfaction; the financial rewards are of secondary importance. The real incentive, Dr. Bush felt, is respect of one's fellows which is enhanced by having a post such as a board member. The reason why men struggle is because they have the satisfaction of guiding the affairs of their fellow men; this is the real reason men serve on boards in the majority of cases.

Of course, the board member has a primary responsibility to company stockholders. But the company also has to deal with public relations, community problems, labor relations, and the public as well as its customers and stockholders. Therefore, one cannot look narrowly only at the immediate interests of the stockholder. In fact, Dr. Bush made the point that it is possible for a director to vote against the long-range interests of the stockholder and still be fulfilling his function properly, in some instances.

(Concluded on page 442)



In clockwise order, banqueteers at Table 9 include: (1) Benjamin H. Bristol, '19, (2) Charles A. Chayne, '19, (3) Bob E. Senseman, G. and (4) Oliver L. Bardes, '21. Those at Table 10 include: (1) Richard N. Benjamin, (2) Wilson Compton, (3) Hartley Rowe, (4) William M. Rand, (5) Robert E. Coulson, (6) Horace S. Ford, (7) Robert R. Duncan, and (8) George T. Cottle, '98.

Tomorrow's Managers

— will have deep sense of trusteeship, encourage technical progress, distribute authority, provide climate favorable to the development of leaders

by CLEO F. CRAIG

When Dean Brooks invited me to come and talk tonight, and I asked him what I should talk about, he said, "Anything you want to say about the future of management generally."

That made me think of the story about two G.I.'s who came down from the hills of North Carolina and into the Army in World War II. It wasn't long before they found themselves on a troopship bound for England. Neither of them had ever been very far from home before going to camp, or had ever been on a ship, or even seen the ocean. But now they were standing on the deck, and the American shore disappeared in the distance, and there was nothing all around but sea water. And the two boys just stood there, watching the waves and trying to get adjusted.

Finally one said to the other, "Man, that sure is a heap of ocean." And the other looked, and thought, and thought some more, and then he said, "Man, it sure is — and man, that's just the *top* of it."

I feel much the same way about this subject of management. It sure is a heap of ocean, broad and deep. The part I want to look at especially tonight has to do with the managers of tomorrow — the stimulating and fostering of personal growth so that more people will become first-rate managers. This one part is quite big enough to make me feel very humble in the effort. I did not say "the management of people" or "management development." Those words imply that we can somehow bring about growth by direction, and I do not think we can do that. Certainly we can impart knowledge and help people acquire skills. But growth is something beyond those things.

Recently a friend told me of a father who was taking his son on a visit to Williamsburg, Va. As they walked through a certain historic house, the father said, "This is where the Jefferson of history was born."

The son, a bright student who knew the facts, said, "Dad, what's the matter with you? You know that Jefferson was born on the other side of the state near Monticello."

"Yes, I know," his father replied. "That's where he came into the world. But this was the home of George Wythe, with whom Jefferson studied law. Here lived the man who helped Jefferson grow to greatness, not by marking out his path for him, but by maintaining the climate that encouraged great qualities to emerge. Jefferson was a bright man by inheritance. That part of him was born near Monticello. And with that part alone he probably would have been well known among his contemporaries. But the qualities of greatness that *we* know him for were born here."

I doubt that anyone really understands the process of human growth. But I think that among other things, growth is a matter of goals to grow *toward;* of room to grow *in;* of risks and responsibilties to grow *on;* and of inspiring and nourishing a deep desire *to keep on growing*. These are the things I should like to talk about most.

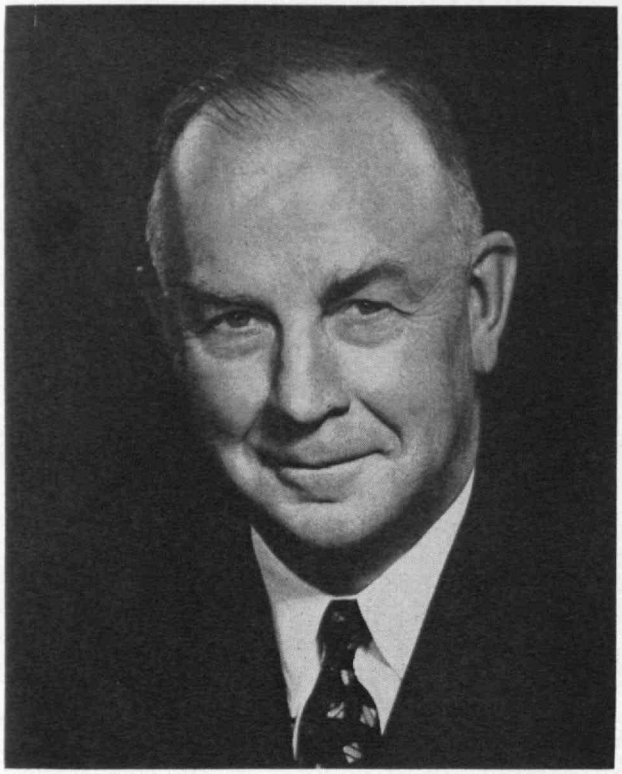
First, however, just a few comments on the aims of management generally. What should our goals be as they relate to the owners of the business — to the public — and to employees?

Our duty to the owners as I see it is to keep the businesses we manage in a healthy state — as to their products and services, and financially; expanding as the nation's needs expand — ever improving our products — and financing this progress largely out of earnings. This means making enough profit so that expansion will not depend mainly on fresh supplies of outside capital. I say this with full realization that the business in which I have been a manager (a business under public regulation) more than most others has needed outside capital to expand. And I say it because I am quite convinced that for any business, regulated or nonregulated, ability to expand out of earnings is the strongest incentive to progress; it gives the greatest encouragement to innovation and the taking of new risks, increases the flow of capital to new enterprises, and in the long run results in the greatest production of goods and services of high quality at lowest price.

What should management strive to provide for the people in the organization? I would say interest, opportunity for individual growth, and real incentives in their work; with these, wages and working conditions that will improve standards of living. These goals are really pretty clear, though methods and speed of accomplishment are troublesome factors. Obviously they are all best attained by good and ample profit, and become very difficult by the lack of it.

I also think such aims with respect to owners and employees help management to discharge its proper obligation to the public. This, as often stated, is to provide ever-improving goods and services, and new goods and new services, at prices which continually bring the enjoyment of additional goods and services within the reach of more and more people.

As a sort of footnote, what about the managers who achieve all this — if they can? What is their reward?



Halsman, N. Y.

Cleo F. Craig . . .
principal speaker at Sloan convocation banquet

For some it is doubtless in money. But my observation is that most men at the top do not actually measure their reward that way, and I imagine those who do find less satisfaction than they may have hoped for.

The real satisfaction is rather in knowing you have done everything you were capable of doing; and the most important part of this, to my notion, is in what you have done to inspire other managers to come forward – not following your path, but walking firmly in their own.

Management's progress in the last generation or so has been materially aided by some important changes in the conception and practice of the art of management. I'll mention three.

The first is the widening and deepening of the sense of trusteeship. The ever-broadening base of ownership has had much to do with this. The very size to which many businesses have grown has had a lot to do with it. So has the obligation on industry to help win wars and help preserve the peace. And public opinion freely expressed has had tremendous influence. As the managers of business have come to know better how much their decisions affect all their fellow citizens, they have gained immeasurably in understanding their responsibilities to the public and to employees, as well as to the owners.

A second aspect of progress is that managers have been increasingly alert to foster and encourage technical advances. I know management did not invent invention, nor is science management's handmaiden. But more and more managers have had the wit to see that new knowledge and new processes continually open the way to new markets. They have visualized new products and services, and boldly spent the money for the research and technology required to achieve them. I cannot prove it but I would guess there have been more industrial innovations of all kinds in the last generation than in any comparable period before. And though often the costs were high and the risks were great, managements have been willing to accept them, to the great advantage of all concerned.

Finally, top managers have learned to decentralize and distribute authority to a greater degree than ever before.

With the increasing size of business necessary in many activities to serve a national market, this was a "must." I am sure there is more of it still to do, but the results so far have been good. Regardless of technical progress, the public would not have been nearly as well served if there had not been a general advance in the art of organizing large numbers of people with various skills in different locations to achieve a common end. And wider and wider delegation of authority has been the key to this.

This brings me to the present and the outlook before us. To put it mildly, it's a formidable outlook. The opportunities are greater than ever, but so are the problems. At least it seems that way to me.

We have a population growing by leaps and bounds, and almost certain to keep growing rapidly for years to come.

We have the prospect of increasing scarcities of raw materials in this country. The prosperity of the United States may well depend on our success in buying these raw materials from other countries, which means of course selling our goods to them. In this field of international trade, the arts of management and statesmanship are interdependent and must complement each other.

We shall see big organizations growing even bigger to serve a bigger nation. The welfare of every community, and of millions of small businesses, will be even more intimately bound up with the social behavior of big business – and the success of larger businesses will inevitably depend on how well they meet their social obligations.

We shall have a faster rate of technological change than ever before. This will profoundly alter the composition of the working force. The impact will not be on productive processes alone, but on the forms and types of industrial organization – on marketing and distribution – and on the very kinds of goods and services that industry provides.

We have the present fact of inflation, and the prospect of more. This is the biggest immediate problem facing the whole country.

Last but not least, we have the vast extension of government controls; regulation in countless forms; taxes that modify almost every phase of business practice. I do not think this is going to change. We have big government now and we are going to keep on having it. It will take constant initiative, and patient and tireless effort, to get and keep understanding of business realities by the people in government who have the authority to control, but who are not responsible for the success of what they control.

These then are some of the prospects. They add up to a world of social, political, economic, and techni-

cal change in which managing anything is bound to be more difficult.

But I would say: How fortunate it is that such perplexing problems lie before us. For this is the environment that will surely produce strong, capable individuals; managements of outstanding competence. Our job as managers today is to do everything we can to help the oncoming talent get its greatest opportunities for growth. In the past we have had many more potential Jeffersons than we ever brought forward; we have plenty of them now; our plain duty is to create the climate in which they will flourish.

I am sure we are all conscious of this, and better yet, we are working at it. For instance, in recent years business has come to a keener understanding of the need for education. We comb the colleges in strenuous competition for the best talent. We send people to school and we organize schools of our own. We conduct seminars and discuss cases. We attack problem after problem after problem with course after course after course. I have only a few things to say about this.

To begin with, as the social and economic structure becomes more and more complex, and the behavior of each part increasingly affects the behavior of others, then it is quite clear to me that people in management must extend their knowledge and broaden their thinking. Exposure to different points of view is essential. And courses and case discussions are worth a great deal when they light up men's minds and cause them to burn brightly.

But valuable as all this may be, we cannot expect too much from it. All the management training and development programs from here to Hong Kong will never of themselves make a man a top-notch manager. Furthermore, this schooling can give both the trainee and his bosses a false assurance that his development is taken care of.

What then can we do? What process, what conditions, what climate will cause more and better managers to emerge in the future? I have no simple answer. I doubt there is one. But I feel rather like the native in the Deep South who was asked by a tourist, "How do I get to Charleston?" He thought the question over carefully and then he said, "Well, suh, you begins from heah." So we begin with what we have to work with.

People in business grow mainly from the jobs they are assigned to do and the way they do them. Delegation provides the route for men to grow to higher responsibilities. But to recognize this is just the *first* step in encouraging a man to grow. The underlying question is, how do we look at the individual? Do we say, "Here is a person we intend to guide according to *our* ideas of how he should grow?" Or do we say rather, as George Wythe must have said to himself when he looked at Jefferson, "We want the conditions of this person's work to be such that he will surely become everything he can be?"

The difference is fundamental. If we try to get people to become something we should like them to be, then, whether we mean to or not, we are limiting their possibilities right from the start. Only when we work to remove all limitations to growth can we expect that the exceptional qualities of able men will emerge to the full, and in ways that no one, including themselves, could have foreseen.

I shall give a simple analogy. No one can tell a scientist what it is that he must discover. We may ask him to attack a specific problem, yes, but the solution can never be prescribed. It is impossible to order up an invention. All we can do is depend on the scientist to discover what he can — to achieve all he is capable of achieving. I think we have to give managers and potential managers room to grow in, in much the same way that we give a scientist room to discover whatever it is possible for him to find.

For example, I think we should get young people into the situation of having to make real decisions early in their careers. And I mean hard decisions. After all, the necessity to choose between different courses of action is the essence of business discipline. We can expect quite a few mistakes but they have two great advantages. First, the people who make the mistakes will learn more from them than from all their successes. Second, making mistakes early is a good vaccination against making more expensive ones later.

Another essential I am sure is to watch incentives carefully. As exceptional men emerge, the rewards they receive and the challenges and opportunities they see ahead must be such as to keep them wanting to grow. If we level out rewards we shall level out motives and abilities too — and I mean level them down.

Still another way to give people room is to give them experience in different kinds of jobs. I know there is nothing new about this, and I am aware of the pitfalls. For instance, a transfer that does not add something — and I would think quite a lot — to the challenge a man feels, can hardly contribute to his growth. Also I would not affirm that in the telephone business (for example) we have never made the mistake of moving people too often, so that it was difficult for them to master some of their assignments.

But when the process is rightly used, so that people see it as offering them new opportunity to grow, I think it contributes a great deal to their all-round ability. Of course I am not talking about picking a man on a hunch and sending him on a rotational tour of the business while everybody else watches and mutters. I am talking about a real test every time on a real job every time. Also it seems to me there is this further advantage: A man on the way up needs to have the organization with him. And I sincerely believe that the man who can prove himself in job after job is the man the organization would like to have lead them.

These, then, are a few of the things we might do to encourage men in their desire to grow — to become all they are capable of becoming. But again let me emphasize that the first need is always for us to accept, believe, and act on the basic principle that a man's growth must be *his*, and not something to be fashioned according to another man's ideas of what it ought to be. Once we proceed on this basis, and only then, we can provide the indispensable favorable climate which really inspires men to grow and keep growing.

(*Concluded on page 434*)

Financial Forces in Industrial Growth

Can we achieve higher standards of national security, living, economic growth, and social capital formation, without running the risk of inflation or depression?

by ELI SHAPIRO

My remarks at this convocation, unlike all Gaul, will be divided into four parts. These parts, in a sense, mirror the objectives and philosophy of the educational mission of the School of Industrial Management.

First, I want to discuss the principles underlying the financing of capital formation, with particular reference to how the process affects economic activity and, in turn, is affected by the manner in which economic activity is conducted in our country.

Second, I want to review the history of business financing over the past quarter century in order to understand the relationship of the past to the present and particularly to stress the responsiveness of the financial machinery to underlying changes in the political, social, and economic environment in our society.

Third, I want to explore the direction of economic activity in the future in order to discern the most probable forms of business financing that managements must plan for in the exercise of their leadership function in guiding the destiny of their businesses.

Fourth, and finally, I hope to point out in broad strokes the nature of the financial adjustments as well as the objectives that managements ought to be thinking about for the future in the light of the probable directions in business financing within the next decade.

Principles Underlying Financing of Capital Formation

Private saving can be utilized to acquire many different assets. Private saving does not imply private investment. But, the ways in which individuals and firms hold their assets can have a tremendous influence on the level of private investment. For, expenditures on private investment require, among other things, an adequate amount of funds in the hands of individuals making investment decisions. And if, to use an extreme example, all savers are seeking to channel their assets into cash accounts, the lower will be the available supply of funds for investment purposes. If we seek a sustained high level of private domestic investment, we must see that there is an adequate flow of funds to finance such purposes.

Saving may be made available for private investment in a variety of ways. Business enterprises may employ their retained earnings directly to increase their holdings of fixed and working capital. Individuals may likewise use their saving to build up their capital goods, as when the proprietor adds to his plant or equipment or the farmer employs his saving to finance improvements on the farm or a person builds a home. Individuals may make their saving available to business enterprises directly by lending money or by buying shares of newly issued stock in these companies. Individuals may also place their funds in financial institutions such as banks and life insurance companies, thereby enabling these institutions to invest these funds with business enterprises.

It is the role of our capital markets to establish the cost of funds and to allocate these funds into uses which promise the greatest returns given the required safety. Individual users of funds who offer new securities have the alternative of selling either debt claims or equity interests. From the standpoint of both the supplier and user of funds, there are risks inherent in both forms of financing, for there is no capital in any form which is not subject to some degree of risk.

If investments are to be made, some individuals or institutions must be willing to bear the risk, must be offered sufficient inducement, and must command sufficient assets to be able to bear the risk. As between investors, contractual forms have evolved which permit the shifting of individual business risks from one investor to another.

The private financial structure consists of equity and debt. Equity refers to the total nondebt (owner) component of the capital structure and consists of the "capital" value of ownership shares (stock) plus surplus and reserves representing claims to the assets and income of business enterprises after creditors' claims are satisfied. Thus, the private physical property of the country is represented, in part, by fixed dollar obligations, and the remainder, by equity (or ownership interest).

In the main, the objectives of averting inflation and depression probably represent the hopes and aspirations of most members of our society — if discussed in the abstract. But, when we get to discuss particular policies, there is an understandable but nonetheless disheartening support of specific programs by interested parties which, when aggregated, lead to a social goal quite inconsistent with the basic stability objectives mentioned above.

We now stand at the threshold of an era in which there is widespread belief that our future economic growth will be even greater than was our past. We

want high standards of living and we want more leisure. We want high levels of private capital formation to provide economic growth. We want high levels of national security outlays to insure our ability to contain the Russians in a cold war and to enable us to withstand attack should the world situation deteriorate. We want social capital formation on a grand scale. Moreover, we purport to desire to avert inflation and depressions. Can we get all of these things?

The neoclassical view on this matter was that an increase in the supply of saving stimulated capital formation by causing the rate of interest to fall, while the willingness to save effectively released resources which were necessary to permit the production of capital goods to take place.

For a relatively short span of years — the twenties in England and the thirties in the United States — a new view appeared. Savings need not finance investment but could go into hoards. Thus, unemployment would exist. Given unemployment, capital formation could take place without reducing consumption (or saving) since the capital goods production could be obtained by absorbing otherwise unemployed resources (both men and material).

While this point of view may have had merit for the aforementioned periods, the longer view of economic history lends credence to the neoclassical position which — to restate it in another way — is that consumption and investment are alternate uses of income. Given the present high levels of employment and income, if we want investment we must save — or abstain from consuming — providing, of course, that we are serious in our desire to avoid inflation. Put it yet another way, given high levels of employment we cannot have our cake (economic progress through capital formation) and eat it (do not save).

In common with many others, I believe an improvement in our understanding of the financial system is eminently desirable. Precisely what form of investigation is necessary to accomplish this objective is now being debated in heated fashion. One thing stands out in my opinion. Regardless of the form of the investigation of our financial system and independent of the findings, the simple arithmetic of capital formation is so far removed from understanding by the public that little progress in changing the financial machinery can be looked for as a result of such an investigation. What is called for at once is a program designed to remove much of the mystery from the capital formation process. An improvement in society's understanding of this process should result in more enlightened views of the costs implicit in attaining the objectives we have laid down for ourselves in the future.

A Quarter of a Century of Corporate Financing

It is desirable to understand the course and direction of private investment during the 25 years ending in 1956 — a period which includes a decade of depression, six years of war-induced prosperity as well as the postwar period.

THE DEPRESSION AND WAR YEARS

During 1929–1939, the country experienced a low volume of investment in plant, equipment, and inventories. The net stock of plant and equipment of all nonfinancial business declined. Figures reported by the Machinery and Allied Products Institute indicate that the net stock of plant and equipment in the United States fell from roughly $180 billion in 1929 to $160 billion at the end of 1939 (in 1955 prices).[1]

The impact of the war upon business finance was that it minimized business' needs for funds on fixed and working capital account. The attack on Pearl Harbor and our entry into World War II made tremendous demands upon our resources both industrial and human as the United States shifted to a war footing designed to maximize the output of goods and services needed for the successful prosecution of the war. The material allocation system that was introduced to insure an adequate flow of resources into war and war related industries permitted few resources to be made available for private investment in plant and equipment.

By the end of 1945, the net stock of plant and equipment (in 1955 prices) was roughly $161 billion, compared to $160 billion (in 1955 prices) at the end of 1939. The 20 per cent hike in gross private national product from 1941 through 1945 (in constant 1955 dollars) was due mainly to a more intensive use of existing facilities rather than to any proportionate increase in the physical productive facilities of the country. The capital-output ratio fell from 2.06 at the end of 1939 to 1.42 at the end of 1945 (in 1955 prices).[2]

At the same time, an inventory control system was imposed. With inventories frozen and sales volume rising sharply, the system brought about an extremely low ratio of inventories to sales compared to earlier experience. This averted an increase in business' need

[1]Machinery and Allied Products Institute, "Capital Goods Review," Number 23 (August, 1955), and mimeographed tables supplied by the Institute.

[2]The capital-output ratio was derived from figures on the gross stock of plant and equipment in 1955 prices supplied by the Machinery and Allied Products Institute. See Footnote 1. The denominator is the gross national private product consisting of gross national product in 1955 dollars minus compensation to government employees.

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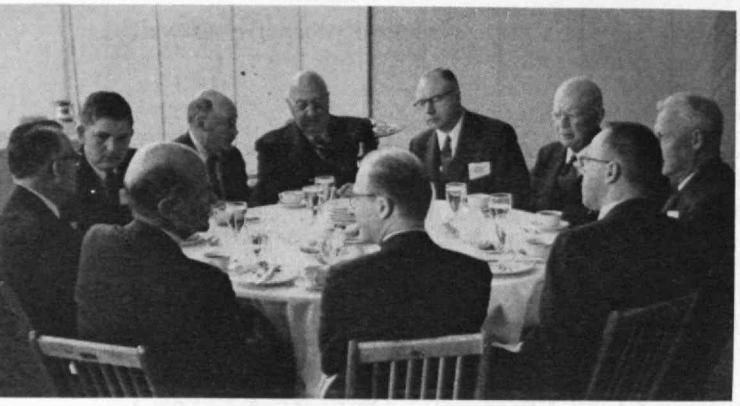
Under the seal of the Institute, Eli Shapiro, Associate Dean of the School of Industrial Management, and Professor of Finance, addresses distinguished guests in Rockwell Cage during the luncheon program of the convocation. The event commemorated the fifth anniversary of the founding of M.I.T.'s School of Industrial Management.



M.I.T. Photo

A group participates in informal discussion during the luncheon in Rockwell Cage, preceding the afternoon panel on "The Evolving Role of the Corporate Director," scheduled to be held in Kresge Auditorium as part of the Sloan Convocation program.

for funds to build up this component of gross working capital which normally is experienced in periods of rising sales.

At the end of the war, nonfinancial corporations were characterized by an unprecedented volume of liquidity. Their holdings of cash and government securities amounted to approximately $43 billion at the end of 1945 and were practically equal to the outstanding short-term corporate indebtedness. While these corporations were extremely liquid when judged by historical standards, they were faced with a great need for funds to finance the replacement of war-worn productive facilities with new physical plant and equipment. Corporations also needed to augment physical facilities to handle the enlarged volume of economic activity that characterized the postwar period. Funds were also needed to increase working capital.

THE POSTWAR DECADE

The average annual use of funds by corporations in the postwar decade amounted to approximately $31 billion. Of this, roughly two-thirds was used to acquire plant and equipment. The remaining one-third was needed to build up the other asset accounts. Roughly $4.5 billion per annum was required to build up the book value of inventories and another $5.5 billion was needed annually to increase the receivables account of corporations.

It is noteworthy that the average annual outlay for new plant and equipment in the postwar decade amounted to nearly four times as large a figure as that for the immediate prewar years and more than triple the figure for the 1920's (all in current prices).

The outlays on plant, equipment, inventory, and receivables were both stimulated and, in large part, financed by the high postwar level of corporate profits and depreciation charges. Annually, about 60 per cent of the need for funds was obtained from retained profits and the depreciation accounts. Net new security issues amounted to roughly $5.6 billion per year with the bond portion dominating; net new equity issues averaged $2 billion annually while net new bond issues amounted to $3.6 billion annually. Mortgage loans provided $1.0 billion a year, and bank loans accounted for $1.8 billion.

These averages obscure trends over the period and cyclical variations in the pattern of demands made upon the capital market. Thus, long-term funds — security issues plus mortgage loans — showed a continual rise over the period. When the long-term sources fell short of total needs for funds generated by plant, equipment and inventory outlays, bank borrowing was utilized. When long-term fund accretions were in excess of outlays for fixed assets and inventory, bank borrowing was repaid and/or liquid assets were accumulated.

The relative cost of short-term and long-term funds obviously affected this pattern. However, comparison of the relative costs of these funds was not the sole explanation of the phenomenon. Corporate managements appeared to follow a few rules about balance between short- and long-term funds which affected the sources of funds they sought. In the main, these rules relate long-term sources to long-term uses.[3] Because of the almost uninterrupted growth in fixed assets in the postwar decade and the need for augmenting the "permanent" working capital of business after 1945, corporations chose continually to raise long-term funds over the period under examination.[4] When these long sources exceeded immediate needs, short-term debt was retired or liquid asset accumulations were accelerated.

Increasing dividend payouts over the period and the volatility of profits after tax are important clues to the pattern of demands made upon the capital market to enable corporations to finance their investment plans. Increasing dividend payout ratios with profits constant would obviously result in reduced internal flows of funds. An increase in dividend payments at a time when corporate profits decline and capital outlays remain constant (or increase) clearly results in increased reliance upon external sources of funds.[5]

While common stock was a small portion of total sources of funds, its importance increases over the period. From less than 25 per cent of total external sources in the earlier half of the decade, common stock issues grew in volume to provide about one-third of total external sources in the latter five years. The proportion of common stock to total external sources of funds rose as stock yields declined.

Another interesting development in the postwar decade was the relatively small share of preferred stock financing. From the point of view of the issuing corporation, preferred stock financing had none of the virtues of debt financing since preferred stock dividends were not deductible in computing taxable income while interest on debt was deductible. Thus, a lessening in the relative importance of preferred shares in new stock financing is observed.

[3]While this contention is difficult to prove, discussion with corporate treasurers tends to confirm this proposition. Needless to say, conformity to this rule increases as spreads between long- and short-term interest rates narrow.

[4]Corporation finance books often refer to "normal" working capital which is that portion of gross working capital permanently employed in the firm.

[5]This argument assumes no reduction in liquid asset holdings.

As a result of the manner of business financing in the postwar decade, a number of developments stand out.

A. One of these is the change in outstanding debt. Total debt in the United States rose from $380 billion at the end of 1945 to $600 billion at the end of 1955. Falling at the beginning of the decade and rising in the latter years, the public debt stood at the same level in 1955 as it did at the end of World War II.

Unlike the previous three decades, the period under examination was characterized by a sharp decline in the ratio of public to private debt. This is explained almost exclusively by the sharp rise in private debt after 1945. Public debt outstanding exceeded the private debt outstanding in 1942 and continued to exceed the latter until 1951 when private debt outstanding exceeded the public debt. Private debt continued to increase for each year thereafter. At the end of 1945, private noncorporate debt (including debt of unincorporated business units, real estate mortgage debt of individuals and consumer debt) accounted for 46 per cent of the private debt outstanding. In the succeeding years of the postwar decade, private noncorporate debt more than tripled while total corporate debt more than doubled so that noncorporate private debt accounted for roughly 55 per cent of all private debt outstanding. The principal factor behind the rise in private noncorporate debt was the very sharp increase in mortgage debt outstanding.

B. Another development of postwar financing was the change in corporate bonds outstanding. The volume of bonds outstanding for all nonfinancial corporations increased from $23.4 billion at the end of 1945 to approximately $53.7 billion at the end of 1955, a rise of roughly 130 per cent. The above changes in corporate bonds outstanding were in marked contrast with the 1920's when all corporate bonds outstanding increased by about 35 per cent.

C. Still another development was the change in corporate liquidity. By almost any other test than the current ratio, the liquidity position of corporations has deteriorated. The ratios of cash to current liabilities, cash to net working capital, cash and governments to current liabilities, and cash and governments to net working capital all fell steadily throughout the decade, reaching their lows in 1956.

Indeed, by 1956 there is at least the suggestion that the decline in the liquidity position of corporations may impair their ability to carry out intended capital outlay programs. A fall in corporate profits, if associated with enlarged dividend payments and no decline in capital outlays, would suggest tightening of internal fund flows.

D. The last development to be discussed is the change in institutional holdings of corporate securities. Throughout much of the decade, a great deal of attention has been given to the flow of funds into corporate securities through the agency of financial institutions. Our data suggest the dominant position of financial institutions in the market for corporate securities in the postwar period.

There has been a dramatic shift in the composition of the bond market. At the end of 1938 there were approximately $46.0 billion of corporate bonds outstanding. The consumer and rest of the world sector accounted for about 65 per cent of these bonds; life insurance companies held about 17 per cent; the banking system's holdings came to 10 per cent.

M.I.T. Photo

Pictured above is J. A. Stratton, '23, Chancellor, who presided at the luncheon of the Convocation of the School of Industrial Management which was held in Rockwell Cage on April 9. At left, E. P. Brooks, '17, Dean of the School, may be seen, and, at right is Professor Eli Shapiro, Associate Dean of the School.

At the end of 1955 the consumer and rest of the world sector held only 20 per cent of the $73.0 billion of corporate bonds outstanding. Holdings of life insurance companies accounted for more than 50 per cent of the total. Two other institutions whose bond holdings were negligible in 1938 call for attention. State and local government retirement systems increased their holdings of corporate bonds significantly. This is true also for holdings of self-administered pension funds. Judged by the absolute amount of their holdings, life insurance companies are the dominant institution in the corporate bond market today. This status is a product of less than 20 years.

Approximately $2.8 billion of net new issues of preferred shares came into the market in the postwar period. Since total institutional holdings of preferred shares rose nearly $4.0 billion, there was a substantial sale of preferred shares by individuals during this period. Net issues of common shares amounting to $18.0 billion were put on the market during the period from 1946–1954. Over this same period some $15.0 billion were acquired by financial institutions. The large acquisitions of common stock were found in the pension funds, nonprofit organizations, investment companies and life insurance companies.

Direction of Economic Activity in Future

Let us look into the future. Economic projections are essentially in the alchemy stage. Yet, we do need some measure, however rough, of the probable course of economic activity and the financial implications implicit in such a projection .

In order to handle this problem I shall use the projection of economic activity for 1965 that was developed by the Joint Committee on the Economic Report in its "Potential Economic Growth of the United States During the Next Decade." These figures generally represent the consensus of opinion on gross national product projections.

Using 1955 dollars and this, of course, assumes no inflation over the decade, the Joint Committee projection entails a rise in the gross national product from $375 billion in 1953 to $550 billion in 1965. This amounts to a 3.2 per cent per annum increase in the gross national product over the period. The 3.2 per cent annual increase in the gross national product is distributed as follows: Consumer expenditures rise by 3.5 per cent per annum; gross private capital formation rises by 4.2 per cent per annum; government expenditures rise by 1.1 per cent annually.

The annual per capita increase in real gross national product is 1.8 per cent — roughly identical with the average rate of increase over the last 75 years. A 1.4 per cent annual increase in civilian employment is offset in part by a 0.8 per cent annual decrease in hours per worker. Thus, the Joint Committee report assumes a net increase of 0.6 per cent per annum in man hours put in. Output per man hour is projected at a 2.5 per cent annual increase, based on the assumption of a high level of investment in plant and equipment and assumed increases in technological know-how.

The proportion of gross private capital formation to gross national product increases from 14 per cent in 1953 to 15 per cent in 1965. Net capital formation rises from 6.6 per cent of net national product in 1953 to 6.8 per cent of net national product in 1965.

A high level of private capital formation and a low rate of saving — 6 per cent of disposable income — is assumed. The Joint Committee's projection involves a high level of investment and, therefore, a high level of financing need. It also is a model which involves a low level of saving which should make for financing difficulties. It is compensated for in part by the assumption of balance in the Federal government's budget and state and local government deficits requiring financing at about the levels now prevailing. The increase in net capital formation of $11 billion in 1953 prices is assumed to be financed by an increase of over $3 billion in personal savings, an increase of some $2 billion in corporate savings, and a reduction in government deficits of $5 billion.

If we turn to the corporate sector, we find a substantial need for funds primarily to finance the plant and equipment outlays contemplated. Funds generated internally by business out of retained profits and depreciation and depletion will continue to supply the bulk of the needs of corporations for financing — over two-thirds of total needs. Net new issues of securities may amount to as much as $7.0 billion with debt issues dominating the total. This sum is not perceptibly higher in absolute amount than most of the postwar years in which high levels of plant and equipment outlays were experienced.

Given this projection of economic activity in the decade ahead, I am inclined to believe that interest rates will be somewhat lower than those currently prevailing. This is not to say that we will return to the level of interest rates that prevailed in the decade of the 1940's. Rather, I am inclined to believe that the average of rates for the first five years of the 1950's is the most reasonable fit for the projection of economic activity in the decade ending 1965 as enumerated above.

Financial Adjustments and Objectives of Management

What are the implications of this projection of economic activity for financial management?

Capital management is that aspect of top management policy which is concerned with a systematic and correct basis for directing funds into and through a business so as to achieve the long-run goals which a company sets for itself. Although these goals might take the form of specific policies with regard to a variety of matters, for example, size, scope of product line, market share, production methods, liability and ownership structure, each such policy is a means to an end rather than an end in itself. The single all-encompassing goal is the maximization of long-run earnings to stockholders, and capital management is directly concerned with this goal.

The postwar decade has witnessed an increasing interest, both in business and academic circles, in the development of systematic approaches to the problem of capital management. Capital budgeting, which is the formal framework in which capital management makes and expresses its decisions, has become increasingly systematic, and considerable attention is now being paid to the principles on which sound approaches to capital budgeting must rest.

There are a number of good reasons for this interest in the capital budget as a prime tool of top management policy:

(1) The collection and projection of national economic data make it feasible for business to make long-range estimates of potential markets. Such estimates, in turn, lead to long-range estimates of facilities and capital required to implement a company's own goals within these markets. Thus, the annual capital budget becomes a framework in which the future of the company is planned, and it is increasingly recognized that decisions made in a series of such budgets will ultimately determine the scope, size and profitability of the company itself.

(2) The increase of special skills and special departments within a company requires a central mechanism in which the many facets of its operation can be brought together for over-all analysis in terms of over-all goals. The capital budget provides just such a central clearing mechanism. Capital is the one element common to all departments and the process of allocating this capital is the principal device through which central management implements total company policy while leaving divisional policies to decentralized units of departments and skills.

(3) The present interest in capital budgeting and management stems not only from the fact that it is important, but from the fact that it is difficult. The task of bringing together technical, market, economic, and financial factors within a single framework so that the decisions which are made truly reflect the best interests of the company as a whole presents difficult problems not only of forecasting and estimating but also of logic and analysis.

(4) Finally, from the social point of view, business as a whole has begun to recognize the crucial impact on the economy of individual capital decisions. Just

(*Continued on page 436*)

Systems Technology and Industrial Dynamics

Modern technology makes possible a new approach to study of industrial organization and future trends

by JAY W. FORRESTER

DEAN BROOKS has given you the objectives of a management school in the M.I.T. community. I will discuss how ideas from a technical environment can be expected to influence the practice of management. I stress here the ideas from engineering and science rather than the influence of equipment. Too often, electronic data processing, as a replacement for clerical workers, is assumed to be the principal technological contribution to better management. More important will be an understanding of how to make information most useful in managing a company. We have much to learn about the relationship of information to the conduct of a business.

When we can look back over the next 20 years, the mechanizing of clerical data processing will seem but a small first step. A greater advance will be the improvement resulting from more effective use of information. The improvement will result from a better grasp of the business enterprise as a whole, and from a better understanding of how information flow and decision-making processes form an underlying foundation that determines and explains the fluctuations in finance, manufacturing, and distribution. In classical economics the emphasis has been on the interaction of money and materials. It may well be that information flow is even more significant than money flow in determining the behavior of our industrial organizations and economic system. One might be partially correct to say that information controls what will happen; money is an evidence of what has happened.

Discussing systems technology and industrial dynamics in the Kresge Auditorium is Jay W. Forrester, '45, Professor of Industrial Management at the Institute.

M.I.T. Photo

During the last decade, while electronic data-processing equipment was being developed, there have been evolving new concepts of information flow, of the relationship between information and control, and of ways to study and predict the behavior of complex systems. By the term "systems" I mean, not the paper work forms and procedures that it often means in business, but the broad interaction of how production, sales, advertising, research, cash flow, and plant construction affect one another and how the external economic environment affects the whole combination.

Management is, I believe, on the verge of a major breakthrough in developing new ways to understand the interaction between the flows of information, materials, man power, and money.

It is the task of management to understand this interaction and interpret these flows into operating decisions. To expedite these decisions, management decision making has been broken down into functional areas. Management education and management practice thereby become fragmentized. Finance, manufacturing, personnel, distribution, marketing, and accounting are too often viewed as separate skills and not as part of a unified system. Much of academic teaching consists of gathering current industrial practice and presenting it to the student as a series of unrelated subjects. Likewise, in his work in industry, the man specializes within divisions or departments where his experience perpetuates the atmosphere of unrelated compartmentalization.

Nowhere, either in formal education or in work experience, is the prospective manager given an adequate, explicit, or even intuitive framework into which to fit the parts of the whole industrial system. Only at the highest management levels do we find attention to integrating the many components of a company. The top-level manager is the man who can better perceive the whole system, its objectives, and its growth. We have a shortage of top-level managers with this over-all perspective, not because of a shortage of candidates, but because potential talent is too often suppressed by the environment, by the pres-

sures of day-by-day routine decisions in the modern organization, and by the absence of an underlying concept of how the parts of the industrial system interact with each other. Industry is becoming increasingly aware of the problem. Solutions have been sought through breaking down the scope of decisions by decentralization, and through formalized training and rotation of management personnel.

I visualize the next big step in management education as the development of a basis for fitting together the many management functions into a meaningful whole. Around this central core, specialized subjects and experience will take on more meaning. Men can be developed more rapidly. They will be able to start from a point now accessible only through long training or fortuitous experience.

The recent history of engineering provides a precedent showing one way in which management may develop in the next two decades. Since 1940 the scope of engineering has expanded in two directions. First, there has been an increasing emphasis on the basic science underlying engineering devices. The great engineering successes of the last 15 years have been achieved by men who have integrated underlying science with the practice of engineering. The effective engineer must understand the enduring fundamentals and not merely their manifestation in particular devices contemporary with the period of his college education. Second, the scope of engineering has simultaneously broadened to formally encompass the interrelationships between the separate parts of complex systems.

The importance of interrelating the separate components has grown until a special meaning has become attached to the term "systems engineering." Articles in the technical press appear under such titles as "Systems Engineering – A Growing Concept" and "Systems Engineering: Its Role in Electronics." The practice of systems engineering is not new, the widespread awareness of its importance is. Systems engineering is the formal recognition of the importance of interaction between the parts of a complete system. This interaction may be economic; it may involve the proper matching of equipment to the requirements, abilities, and limitations of people; it may involve the proper kind and timing of information flow from one part of the system to another.

Training of the manager today is in much the same state as was engineering training before 1940. So far, there has been no development of a fundamental concept explaining over-all operations; nothing to relate company organization and decisions to stability, profits, and growth. As happened in engineering, I believe management education is now ready to develop both an underlying foundation of communication and decision principles, and also an orderly basis for integrating the various company activities into one coherent system.

We need new approaches to understanding the dynamic behavior of a company. By dynamic behavior I mean the way an organization reacts to changes – changes in financial conditions, product demand, new competitive conditions, growth, technological advances, new policies, or new social responsibilities which are presented.

The behavior of business organizations under static conditions is fairly easy to grasp. But conditions are never static. There is inadequate understanding of how the company organizational structure, information flow channels, and decision-making procedures often convert small external influences into amplified oscillations within the system. For example, how often do we erroneously blame consumer demand for production changes that are actually caused by the information delays and ordering policies within the company? How often does advertising policy cause unanticipated inventory and manufacturing fluctuations? How often has an apparent seasonal demand pattern been unintentionally created by the company's marketing and inventory policies rather than by the consumers? How often is company growth hampered by an incorrect distribution of research and development man power between long range, medium range, and immediate goals?

These kinds of questions are continuously encountered by the executive. They must be answered on the basis of experience and intuitive judgment. Only now is there taking shape a basic framework that should help answer these "systems questions." By "systems questions" we mean the problems of coordinating the goals, policies, procedures, and decisions of each part of the organization to best promote the objectives of the company as a whole.

The principal technological contribution to management will, I believe, be the ideas from which a basic framework of management theory can be evolved. There are three pertinent areas that are well advanced in the technical professions – the theory of feed-back control systems, the study of decision-making processes, and the simulation of complex system behavior.

Technological Contributions to Management

Theory of Feed-back Control Systems – First, at the beginning of World War II, the theory of feed-back control systems, or servomechanisms, was put on a formal and orderly basis. In a feed-back system, information and actions affect one another continuously in a closed loop. The feed-back system permits us to observe the results of our actions and continue to make corrections until the outcome is satisfactory. However, such systems can become unstable and oscillate if there are too many time delays in the closed loop or if control actions are too drastic. Conceptually, the feed-back system is of great significance in understanding our everyday experiences. As you reach for a pencil on the table, your eyes detect the discrepancy between your hand position and the pencil, thereby producing correcting signals that go to your arm muscles; as you drive a car the control loop of steering wheel-to-auto-to-street-to-eye-to-hand permits you to stay on the road.

In business, orders and inventory levels lead to decisions on manufacturing rate which permit filling orders and correcting inventory; a profitable industry attracts competitors until the profit margin is reduced to equilibrium with other economic forces; the competitive need for an improved product leads to research and engineering expenditure which produces

technological change; the need for additional capital leads to borrowing or reinvesting earnings toward company expansion. All of these are information feed-back control loops. The information feed-back process is continuous, and the new results lead to new decisions which keep the system in motion. Almost every management decision affects the situation on which the decision was based and is therefore part of a feed-back control loop.

The analysis of feed-back systems treats the use of information for the purpose of control. It helps us understand how the amount of corrective action and the time delays in interconnected systems can lead to unstable fluctuation in the controlled output. My example of driving an automobile is too perfect a system to show the important influence that the information channels have on system behavior. Industrial and economic systems have many stages and delays between decisions and the resulting actions. Automobile driving would be a better example if the structure of the information flow channels were changed. Suppose the driver were blindfolded and drove only by instructions from his front seat companion. The resulting information delay and distortion causes the erratic driving. Indeed, in business one does not have a clear view of the road ahead. The automobile feed-back system example might be still more representative of the business enterprise if the blindfolded driver could get instructions only on where he had been from a companion who could see only through the rear window.

This is not an absurd analogy. In business, as in other fields, our estimate of what will happen in the future must be based on the past and present. Feed-back theory explains how the decisions, time delays, predictions of the future, and cascaded sequences of actions can produce good control or dramatically unstable operation of the whole system. In business these unstable fluctuations appear as large swings in inventories and production rates, and in business cycles.

Study of Decision-Making Processes – The second thread of our picture is the study of decision-making processes. Studying decision-making processes has been a companion to developing digital computers. Most computer applications involve automatic decision making based on predetermined rules. The digital computer, as an element in a feed-back system, forces the critical examination of the factors influencing decisions.

Under the stimulus of military necessity, weapons systems have been carefully analyzed so that digital computers might be used to speed information flow and decision making. It has been necessary to distinguish between the kinds of decisions which are best made by people and those which can better be made by machine. Success in analyzing military systems promises better understanding of decision making in our commercial and economic systems. Our industrial systems are considerably more complicated than even the most advanced military weapons systems. However, in business we have an important advantage – one can observe the company in its real life environment. An air defense system does not receive an actual real life test until it is too late for a redesign. Where business can continue to learn by trial and error, the military system can only be tested in advance by mock battles and by simulation.

Simulation of Complex System Behavior – This brings us to the simulation of large systems which is a third technical development of importance to the future of management. Simulation has here its ordinary meaning of presenting the appearance of the system under study without, in reality, being the system. Simulation is the representation of a real system and its operation by a model. In our present context, simulation means setting up, in a digital computer, the conditions which control the flow of information, money, materials, and labor within the company. On the basis of the initial description and assumptions about company operation, the computer then generates the resulting charts of financial and product movement.

A simulation study is valuable in two ways: First, it forces a careful analysis of over-all company operations, policies, long-range financial plans, productivity, profitability, communications structure, and decision-making procedures. The mere finding of the necessary and pertinent facts for a simulation study will in itself reveal useful and previously unknown information about the company. Knowledge of the pertinent, previously unavailable, facts will alone lead to improved operation. Second, when the dynamic model of company operation has been set up, graphs of company performance can be obtained quickly for many different assumed operating conditions. The effects of different factors can be separated. The dynamic behavior under changing conditions, which is almost impossible to visualize intuitively, can be quickly and easily obtained.

Simulation is being used in the design of guided missiles, for studying military tactics, for training personnel, and in engineering work. For example, in planning the development of a river basin, numbers in a digital computer represent water volumes, flow rates, electric demand, and rainfall. A few seconds of computer time can solve a day of system operation. Dams can be located and designed for an optimum compromise between the benefits from hydro-power generation, irrigation, navigation, and flood control. The problem is similar to that faced by a manager in deciding plant locations, financing, advertising, and production.

To use simulation studies will not require an extensive mathematical ability. To be sure, details of setting up a study will need experts because there are special skills required and pitfalls to be avoided. However, directing the situations to be explored, judging the assumptions, and interpreting the results will be within the ability of the type of man we now see in management schools and executive development programs. We can expect simulation of the dynamic behavior of industrial organizations to be a useful tool for the thoughtful manager of the future.

Industrial Systems

Thus far, I have suggested that the greatest contribution from technology to management education will be a basis for integrating the various aspects of

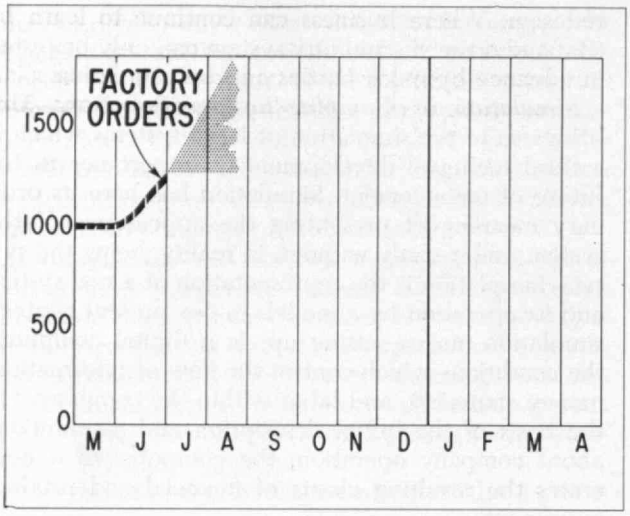


Fig. 1. Change in number of orders (heavy line) poses problem of future trends which may reasonably be expected to lie within region represented by cross-hatched area.

management into a unified "systems approach." Our capitalist type of economy and the individual company within it, each represent a feed-back system. Communication is the unifying structure that ties either a company or the economy together. Without the ability to transmit information and to ship goods we would revert immediately to an agrarian or nomadic society. The delays and distortions in communication channels cause much of the fluctuating behavior of our industrial society. The theory of control systems using information feedback, coupled with a knowledge of decision processes, can explain how information flow affects the dynamics of the whole system. The digital computer, used as a system simulator, gives us a practical tool for studying the dynamic behavior of complicated systems.

We can think of an industrial organization as having four aspects: (1) a flow of physical goods; (2) a movement of man power; (3) a flow of money; and (4) an information and decision network that ties together and interrelates the first three.

So far, this may all seem rather general and vague to you. Let's take a very simplified example of one part of a company to illustrate what I have been saying. Suppose you manufacture a durable consumer product like washing machines, and the orders received week-by-week at your factory are shown in Fig. 1. Each vertical line is a month. The chart shows orders per week. For the past six months you have been selling 1,000 units a week at a rather steady rate. Four weeks ago, at the end of May, orders received from your distributors started up as shown.

A decision must be made on future manufacturing rate. The lead time in the factory is several weeks so that production-rate decisions are made well in advance of increased output. The factory production-rate decision must depend on several considerations. If the factory warehouse inventory is not to be seriously depleted, the manufacturing rate must at least be increased to the new sales rate. Because of the factory lead time, inventory will drop during the weeks while waiting for the new, higher production level to be established; therefore, units must also be produced for inventory replacement. The production-rate decision must be based on some presumption about future sales trends. As shown by the cross-hatched area of Fig. 1, future sales might be predicted to level off at current values, or be extrapolated along an extension of the curve. Probably most predictions would lie somewhere in the shaded area. Taking the lowest and most conservative guess, that is, sales will continue at the present level, you may still wish to add temporarily to the manufacturing rate to build up inventory to a new, higher level corresponding with the new, higher sales volume. As a result, factory production rate is increased to correspond, first, with current sales; second, to replace inventory lost while the new production rate is being established; and, third, to increase inventory somewhat to correspond with the new, higher sales volume. The decision is not to increase production by the further extra amount which would correspond to extrapolating upward the current sales trend.

By the end of July we find, in Fig. 2, that the order rate has continued to rise and factory output is beginnning to increase. At the end of October, we find that orders have fallen considerably but, because of the lead time, factory output is just reaching its peak.

In Fig. 3 we see the order and factory output pattern for the 48 weeks following the initial increase in orders. Orders have gone from 1,000 units per week to 1,350 units per week in 11 weeks. In another 14 weeks orders had dropped to 900 units, later coming back up to 1,100 units per week.

Now, we are ready to ask what was happening elsewhere in the system during this interval of almost a year. What caused the large up and down swing in production? Could something have been done to achieve a more uniform production rate? Is this a seasonal fluctuation in sales which will repeat in the next year? Does the manufacturing fluctuation result from corresponding changes in the whims of the fickle consumer, or from causes that are controllable by the manufacturer?

In an ordinary situation, one might have trouble locating answers to such questions. However, the

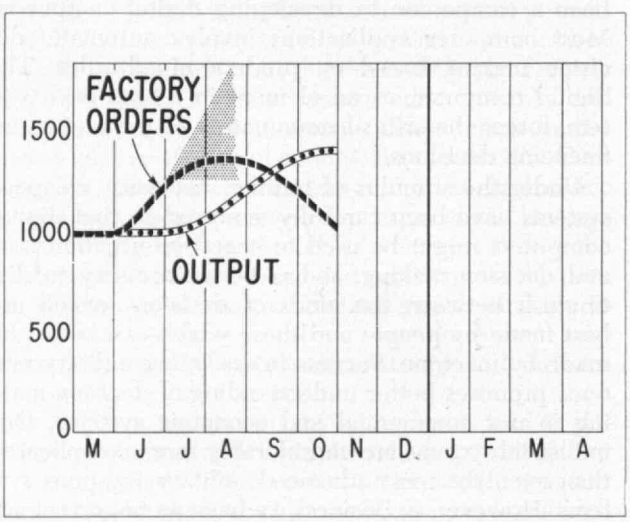


Fig. 2. Changes in orders, compared with modified production operations, show effect of lag time in correlating these two important operations of a manufacturing plant.

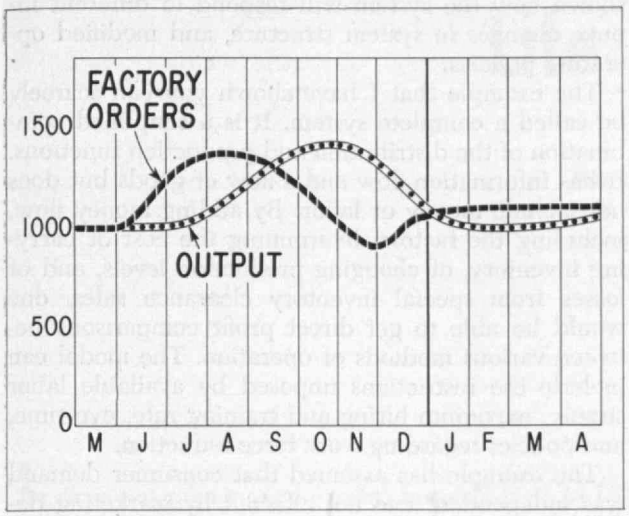


Fig. 3. Number of orders (heavy line) and factory output (dotted line) for 48 weeks show significant oscillations resulting from inability to forecast speedily and accurately.

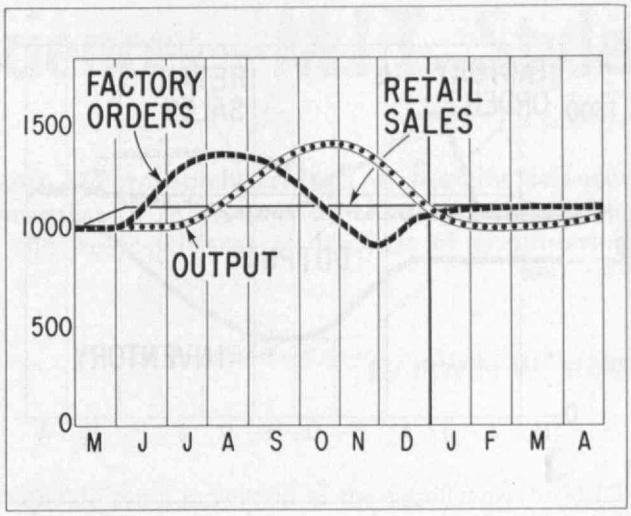


Fig. 5. Retail sales (light line) which have caused oscillations in industrial operations are seen, with hindsight, to have been of simple type.

production curve we have just seen is from a simulation study. Therefore, because we have a model of this particular factory and distribution system, we can determine the effect of changes in that system.

First, in Fig. 4 is a flow diagram of the manufacturing and distribution organization. It is a rather ordinary structure. The bottom box represents the consumers. Above this is the retail level, then the distributors or wholesalers, and at the upper left the factory and factory warehouse. The dotted lines show information flow, here consisting of orders for goods; the solid lines show the shipment of goods. Besides the organizational structure as shown, two other things are needed to describe the system adequately for our present purposes. We must know the delays in both the flow of information and in the shipment of goods, and we must have the decision criteria used for the placing of new orders by each level of the system. The average delays are shown on the diagram in weeks. Goods are delivered to the customer the week after he places his order. At the retail level, the delay averages two weeks between an actual sale and when an order is sent out to obtain a replacement. Mailing delay for the order is a week, the distributor takes a week to process the order, and delivery of the goods takes another week. Similar delays exist between the distributor and factory warehouse. The factory lead time averages eight weeks.

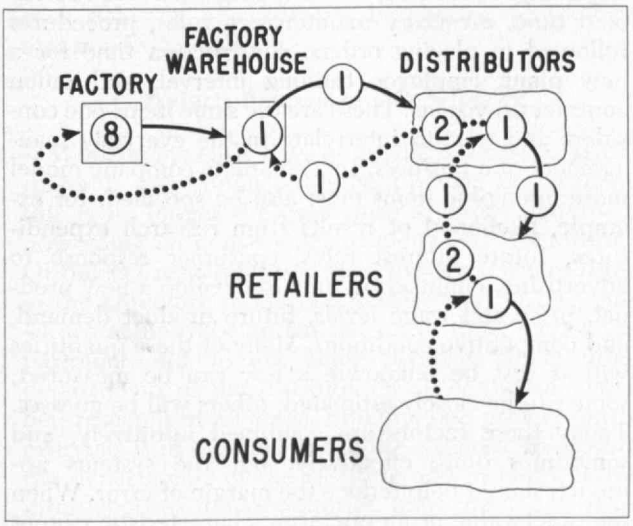


Fig. 4. Flow diagram showing the essential steps in manufacturing and distribution operations, and their interrelations in organizational structures.

The ordering criteria used at each level are the same as already discussed for the factory. No prediction of sales trends is used. Orders are placed to cover current sales rate, plus orders to replace inventory depletions that occur while waiting for replacement stock, plus orders to change the desired level of inventory as the average volume of business increases and decreases. If we then use this flow diagram, with the delays and the ordering criteria, it is possible to calculate how consumer demand changes will be propagated upward through the system. I will not take time to explain the calculation process which consists of moving, week-by-week, the shipments and orders that would flow in the system and generating the resulting inventories and production rates.

In Fig. 5 have been added the retail sales which caused the factory order fluctuations previously discussed. To test the dynamic response of the system to small disturbances, the consumer demand was increased two and a half per cent per week for four weeks and then the sales held constant thereafter at the 10 per cent level. The sales increase is delayed in reaching the factory by the delays at the retail and distributor levels. The retail sales increase is amplified at each distribution stage by the replacement of inventory depletions and the desire to increase inventory with increasing sales volume. Factory orders start to increase five weeks after the retail increase and reach a peak of 135 per cent in 15 weeks. The amplifying factors are reversible so that ordering rates fall after inventory demands are satisfied. Production drops, for a time, below that needed for the new steady demand. Nearly a year is required to dissipate the disturbance caused by this single 10 per cent demand change.

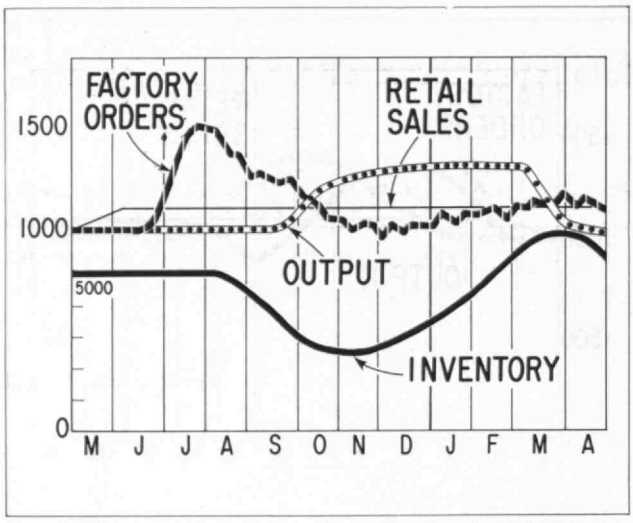


Fig. 6. Plot of orders, sales, and production of another industrial organization, and illustrating the need for rapid information processing if fluctuations are to be minimized.

The precise nature of the response is, of course, entirely dependent on the characteristics of the system being studied. Different inventory policies, a longer or shorter factory lead time, more lag in filling and shipping orders, or slower accounting and ordering departments would all affect the result. If future orders had been predicted by extrapolating the trend of past orders, the fluctuations would have been even more severe. In Fig. 6 is a chart for a slightly different distribution system. In addition to some changes in time delays, the factory capacity was assumed limited to 1,300 units per week. With these system changes, the factory output has become a differently shaped curve. Also shown is the inventory level at the factory. You will note that factory inventory drops to half and later rises to one and a quarter times its initial value. Although not shown on the graph, the total inventory, for factory, distributors, and retailers combined, varies only 10 per cent during the year.

The relationship I have shown you between retail demand and factory production is not unusual. It is common, in varying degrees, to all enterprises. In the extreme, complete production shutdowns often result from fluctuating inventories; inventories that may accumulate, not because sales of the product have stopped but because small demand variations are amplified. To many people this oscillatory behavior is rather mysterious. It is, however, a natural consequence of a feed-back control system containing certain kinds of time delays and amplification. Changes in the system would cause changes in dynamic behavior. For example, the trend toward fewer, larger, retail outlets which order directly from the manufacturer, eliminates one distribution level, changes the communication structure, and will have an important effect on system behavior. Or a different inventory policy, with air freight to back-up critical situations, might be more profitable. Or, more up-to-date information at the factory about actual retail sales would clearly be beneficial. I have heard the serious proposal made to collect sales data by leased wire from all retail outlets to help solve the problem of distribution system stability. Is this necessary, or would proper use of a sampling of sales in a few stores be sufficient? By the methods I have discussed, it can be shown how the system will respond to different inputs, changes in system structure, and modified operating policies.

The example that I have shown you can scarcely be called a complete system. It is a simplified combination of the distribution and production functions. It has information flow and a flow of goods but does not include money or labor. By adding money flow, including the factors determining the cost of carrying inventory, of changing production levels, and of losses from special inventory clearance sales, one would be able to get direct profit comparisons between various methods of operation. The model can include the restrictions imposed by available labor supply, maximum hiring and training rate, overtime, and policies regarding work force reduction.

The example has assumed that consumer demand was independent and not affected by marketing decisions in the manufacturing and distribution system. That assumption is certainly not compatible with our national confidence in the persuasiveness of advertising. If we were to include advertising and marketing in our model, consumer demand for the product of a particular business firm would no longer be independent of production and inventories in the system. The retailer may offer special price discounts if he is overstocked; the company may gear its national advertising to its sales level or to the state of inventories. If the consumer purchases are affected by these special sales and advertising, the consumer then becomes a part of the closed-loop control system. Depending on the relative timing of advertising response, the resulting effect may be either to counteract or to reinforce the oscillations we have already seen in the distribution system alone. In a simulation study, various assumptions about advertising effect could be tested. In fact, a few companies are already measuring the dynamic characteristics of advertising response which we would need for this kind of study.

To set up a dynamic model, one must adequately describe the real system which it represents. Getting the data will often be difficult. However, the kinds of information needed involve the basic characteristics of the company, such as, delays in accounting departments, mailing and shipping intervals, factory lead time, inventory maintenance rules, procedures followed in placing orders, construction time for a new plant, employee training interval, and union contract provisions. These are the same items one considers and tries to interrelate in the everyday management of a business. In a complete company model more intangible items must also be specified; for example, likelihood of results from research expenditures, future interest rates, consumer response to advertising, engineering time to develop a new product, price and wage levels, future product demand, and competitive conditions. Many of these quantities will at first be unknown; a few can be measured; some can be closely estimated; others will be guesses. Today these factors are combined intuitively, and sometimes quite effectively, but the systems approach should help reduce the margin of error. When the exact value of an operating characteristic cannot be established, one can test the system with a range

(*Continued on page 428*)

Life Sciences—M.I.T. Style

At present 117 research projects in the life sciences are in progress at M.I.T. and all show a strong influence of the basic sciences as well as of engineering

by IRWIN W. SIZER

It does not take a very careful inspection of M.I.T. to realize that it is humming with activity in the field of research in the life sciences. This comes as a surprise to many who do not ordinarily associate the name of M.I.T. with the various aspects of biology and who do not realize how ideal are the Institute's facilities for research in this area. However, the field of the life sciences is by no means a newcomer on this campus, since in actual fact it was set up as part of one of the original six courses of instruction laid out by William Barton Rogers when the Institute opened its doors in 1865 and was included in the curriculum entitled "Science and Literature." Rogers was personally very much interested in natural history and in 1871 set up a department in this area designed to prepare students "whose ulterior object is the special pursuit of geology, mineralogy, botany, zoology, or to prepare for medicine, pharmacy, or rural economy."

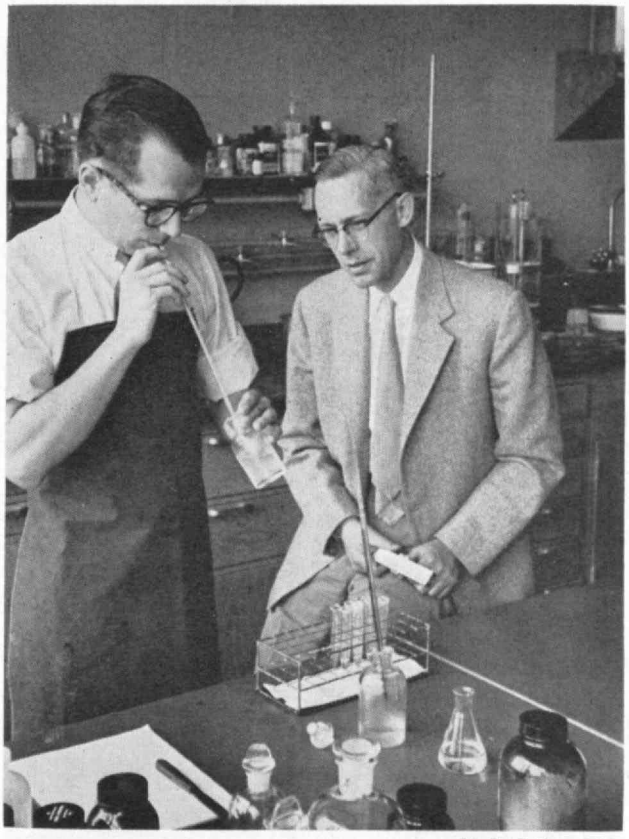
Biology was set up as a separate Department from Geology as early as 1889 under the distinguished leadership of Professor William T. Sedgwick. Since that time biology has flourished at M.I.T. especially with reference to certain applied fields, such as public health, bacteriology, sanitary engineering, and food technology. More recently the application of the physical sciences and engineering to biology has influenced the development of teaching and research in such fields as biochemistry, biophysics, physiology, and molecular biology.

Projects Related to Life Sciences

While in the early days of the life sciences at M.I.T. research was confined to the Biology Department, this is no longer the case since vigorous activity is now going on in many departments and laboratories. Of the 117 research projects in the life sciences listed in the Directory of Current Research at M.I.T., only 44 are actually being carried on in the Biology Department and 73 are being investigated in other departments of the Institute. Of all of the nonclassified research in all areas, roughly, one project out of every six is in the field of the life sciences. In most of the departments of the Institute and in many of the interdepartmental laboratories, there are one or more projects going on which are closely related to the life sciences. A brief survey of these projects will give a bird's-eye view of their nature and location as well as provide some indication of the significance to M.I.T. of research in the life sciences.

As one might expect, the major concentration, by far, of projects in the life sciences is in the Department of Biology. With the exception of Food Technology, which also has many investigations in this area, research in the life sciences is widely scattered throughout many departments and laboratories of the Institute. It might be revealing to consider briefly the types of research in the life sciences which are being pursued in the various departments and see why more than $1,000,000 is being invested each year by industry, government, and foundations in this area which has become so vital to M.I.T.

Chemical Engineering is applying thermodynamics to problems of heat exchange between human skin



Medical Press, Inc.

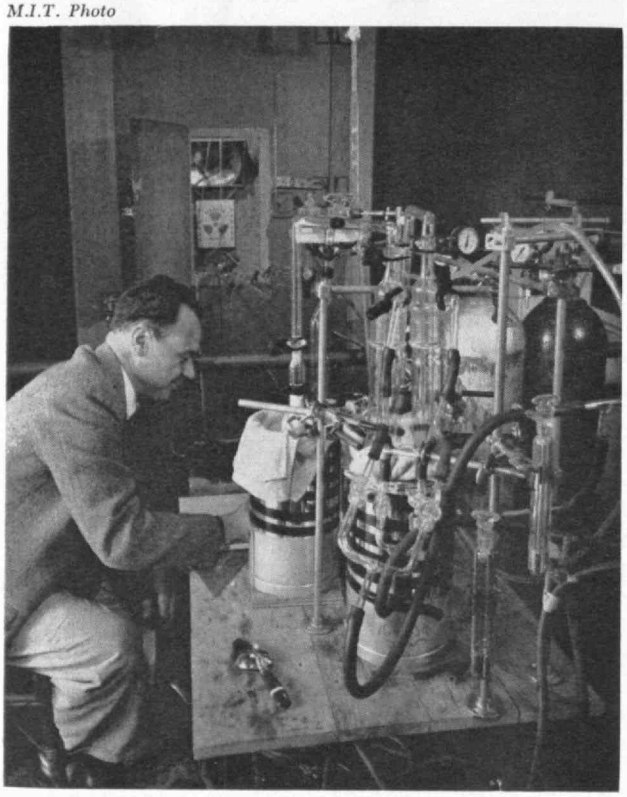
Biochemists of the Department of Biology study enzymes from liver which oxidize amino acids.

and various types of cloth in the hope that this investigation will make possible the design of more suitable types of clothing. Major interest in the life sciences in this Department, however, centers around the field of atomic energy. Particular emphasis is being placed on the use of radioactive isotopes in medicine, with special attention to problems of the thyroid gland and the localization of malignant tumors in the human body. The new nuclear reactor will have special facilities for biological and medical research.

The Department of Chemistry has a number of projects aimed at the synthesis of compounds with high physiological activity. These include such highly active materials as penicillin, peptides, the vitamins A and D, nitrogen analogues of the sex hormones, alkaloids, and terpenes, including those of special interest in perfumery. In addition, the Chemistry Department is interested in the fundamental mechanism of polyfunctional catalysis and its relationship to biological catalysts, the enzymes. Important applications to industry and medicine may result from these studies. Considerable work is also centered on studies of the physical chemistry of proteins and their interaction with small molecules and ions. This work has been of great significance in contributing to our understanding of the role of proteins in blood.

The Department of Civil and Sanitary Engineering has a number of research projects in the life sciences primarily in sanitary engineering. These problems are centered around a study of various types of wastes, including problems of decontamination of radioactive wastes and the bacterial destruction of synthetic detergents. Microbiological investigations are being carried on in the field of anaerobic sludge digestion, as well as in the area of the aerobic stabilization of organic and industrial wastes. Chemicals such as plastics and synthetic detergents pose a special disposal problem since they do not occur in nature and are not readily attacked by bacteria. In Civil Engineering there is a fascinating study in the field of structural biomechanics which has to do with the structural characteristics of the intervertebral disc of the spine and the relationship of this disc to the possible cause of lower back pain.

M.I.T. Photo



Research on the sterilization of milk by irradiation during distillation is carried on in the Food Technology Department.

Investigations in the life sciences carried on by the Department of Electrical Engineering cover a wide spectrum indeed. One group of projects is primarily concerned with the field of acoustics and the application of acoustical techniques to biology and medicine. This includes the measurement of sound propagation constants with relationship to the structure of tissues and the use of focused ultrasonic sound for producing lesions in tissue. Another aspect of this investigation has to do with speech communication and a study of speech perception. These investigations are being carried on simultaneously with other aspects of communication problems. This Department has already developed an outstanding reputation in the field of the application of high-energy x-rays and electrons to biology and medicine. In this connection a most successful clinical research program on 2,000,000-volt x-ray therapy of malignant diseases is under way and this study is correlated with the effects of x-radiation on physiological and psychological functions. High-energy electrons are being used to irradiate and sterilize such biological systems as bacteria, viruses, protein, enzymes, pharmaceutical products, and food. This Department has also pioneered the field of oceanographic photography and has designed cameras capable of taking pictures of biological specimens at the bottom of the deepest ocean.

In the Communications Division of the Research Laboratory of Electronics, there are a number of problems having to do with speech. There are many facets to the researches going on in this area which encompass an analysis of languages with reference to the speech process, including physical, physiological, and social constraints to which all languages are subjected. There is also a project on speech comprehension and speech coding basic to problems which arise in information theory and its application to communications systems. As a by-product of these studies, sensory aids have been developed which involved the design of devices to be used for both visual and auditory aids. Considerable attention is being devoted to the development of the area of communications biophysics with reference to the electrical activity of the central nervous system. Computation methods are being devised for analyzing the data from nervous activity both spontaneous and evoked. In the field of neurophysiology, an investigation is being made of the relationship that exists between the electric current flow in nerve elements in the region of synapses and the modes of transmission from one nerve to the next.

As one might expect, there is a major concentration of projects in the life sciences in the Department of Food Technology. Many of these center around the use of radiant energy in a study of its effects on foods

and living systems. Special attention has been devoted to the use of x-rays and electrons for this irradiation. Effects of radiation have been investigated on such diverse biological systems as microorganisms, amino acids, enzymes, vitamins, proteins, and foods in general, with special emphasis on the effect of irradiation on flavor, odor, and nutritional value. This Department has pioneered the field of "cold sterilization" of foods and pharmaceuticals by irradiation. A number of projects in the field of nutritional biochemistry are being carried on in this Department. These include studies on nutrition of rancid and heated fats and oils and investigations on calcium absorption and metabolism in rats, monkeys, and children using radioactive calcium. In addition, an investigation into the cause of flavor in foods is being made in an attempt to identify the flavorful components of coffee, milk, and fish.

In the Department of Geology and Geophysics special attention has been given to a study of fossils in ancient rocks and the use of radioactive tracer techniques in determining the age of the rocks and the fossils which they contain. Recent interest in oceanography will extend to a consideration of life in the sea.

The School of Industrial Management has a project on psychological measurement in which an attempt is being made to systematize and describe the methods of psychological scaling as developed in the fields of psychophysics, mental testing, aptitude measurement, and merit rating. In addition, there is a study of problem-solving groups and how such groups organize for effective problem solution. The pattern of communication structure and how it develops is being considered as a function of mental attitudes, type of task, and degree of leadership assignment.

In the Mathematics Department, in addition to its interest in cybernetics, there is work going on in the field of analytical psychodynamics. Included in this work are polynominal derivations of the error involved in the measurement of neurosensory mechanisms for application to psychology and neurology.

The Department of Metallurgy is applying flotation techniques, developed for the separation of minerals, to the separation of bacteria and other microorganisms from fermentation systems. Since one source of slime coatings on minerals is microorganisms, this Department is also studying the formation and removal of slime coatings on floating and nonfloating minerals.

For many years the Department of Physics has been interested in the biological effects of atomic energy. Special emphasis has been given to the genetic effects of atomic radiation and their significance to the present and future generations. At the present time, studies are considering the long-term effects of radio elements on humans who ingest significant amounts. In addition, the Department of Physics has been interested in the biological and medical effects of focused ultrasonic sound and their biophysical interpretation.

Projects in Industrial Medicine

It may come as a surprise to many that the Medical Department is also a center for research in the life sciences. In this Department there have been a number of projects in the field of industrial medicine, particularly with reference to medical hazards of M.I.T. research. Problems dealing with effects of radiation and radioactive chemicals have come in for a large amount of attention. Methods have been developed to detect air-borne contaminants including methyl alcohol and certain acids and organic materials. In addition, the Medical Department is co-operating in a number of the research projects in the life sciences which are being carried on in other Departments and in hospitals.

M.I.T. Photo

In the Department of Electrical Engineering this soundproof room is used for studies in acoustical biophysics.

Research at Molecular Level

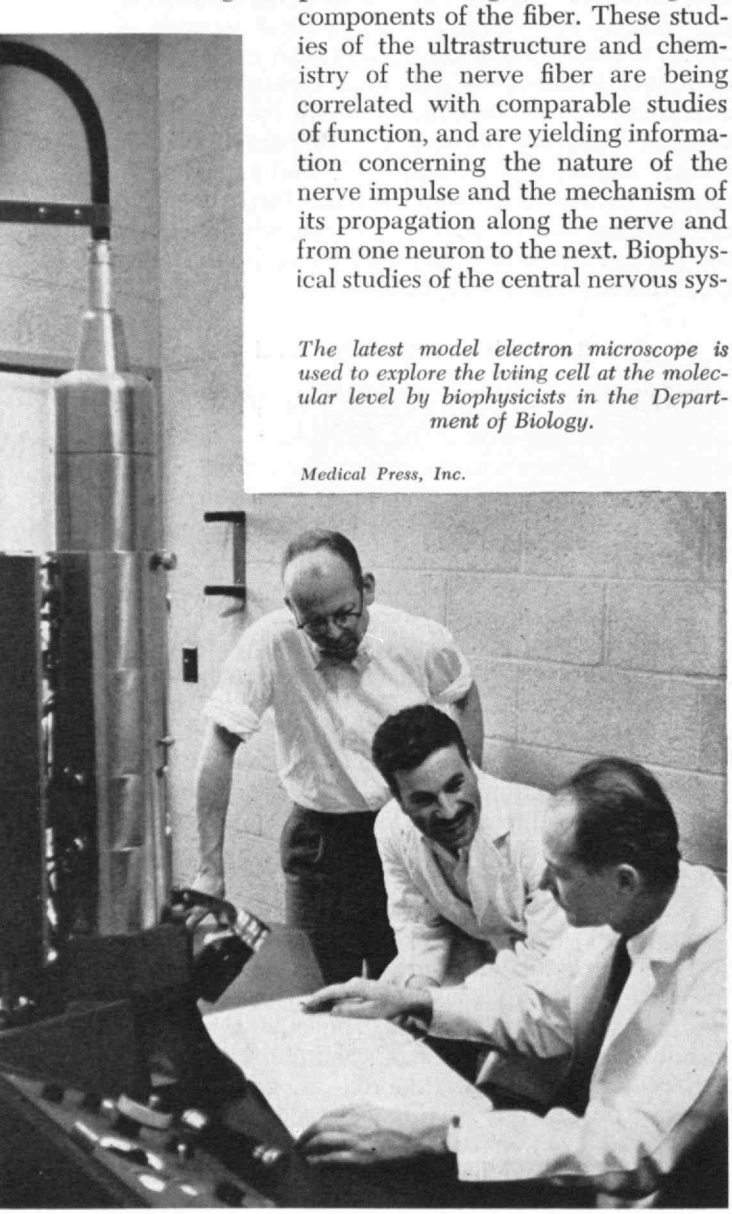
In the Biology Department there is a great concentration on research at the molecular level. Polymers of the cell are receiving particular attention, and their chemical and physical properties and origin and role in the living cell are being studied intensively by many different approaches. In these investigations the techniques of physical chemistry, x-ray crystallography, electron microscopy, enzymology, microbiology, and radioactive tracers have been especially useful in yielding information concerning these giant molecules. Of the polysaccharides, starch has received special attention, particularly with reference to the helical arrangement of its molecules as revealed by x-ray diffraction and electron microscopy. For many years interest has centered on the collagen molecule from connective tissue, and the cross-banded helical arrangement of collagen fibrils has been worked out in several laboratories of the Biology Department. More recently the dispersion of collagen molecules in aqueous solutions and the reconstitution of fibrils from such solutions has been studied. The formation of collagen in connective tissues, especially in regenerating wounds and in tissue culture, has been investigated and the role played by vitamin C in this process has been elucidated. The transformations involved in the conversion of collagen to gelatin by heat have been studied in some detail and

a homogenous parent gelatin has been isolated. All of these studies are contributing greatly to our knowledge of the synthesis and function of collagen in healthy and diseased connective tissue.

In the case of muscle, attention has centered upon the isolation of fibrous protein components, particularly paramyosin, actin, and myosin, from the muscle cell and these components have been examined with the electron microscope and the x-ray camera. From these studies the role of fibrous proteins in muscular contraction has been partially deduced. New techniques have been developed for preparing ultrathin sections of chick heart muscle at various stages of embryonic development, and examination with the electron microscope has revealed the various stages through which muscle passes during growth of the embryo.

Nerve Fiber Studies

A many-pronged attack is being made upon the nerve fiber, primarily using the giant nerve fiber of the squid. Valuable information has been obtained concerning the proteins and organic and inorganic components of the fiber. These studies of the ultrastructure and chemistry of the nerve fiber are being correlated with comparable studies of function, and are yielding information concerning the nature of the nerve impulse and the mechanism of its propagation along the nerve and from one neuron to the next. Biophysical studies of the central nervous system with special reference to communication pathways, nerve nets, and synapses between nerve fibers are being investigated with higher mammals, such as the cat. The structure and function of membranes of living cells are the subject of study in several different systems. The membrane around the nerve fiber, the myelin sheath, has been shown to be wrapped around the fiber like a jelly roll. The physical and chemical properties of such membranes are being investigated with reference to the permeability of the membrane. Radioactive tracers have given valuable information concerning the exchange of water and other chemicals across the nerve and muscle membrane. The electrical properties of such membranes have also been examined in some detail and have been related to the permeability of the membrane and the relation between membrane electrical potential and excitability. The localization and function of certain enzymes in the cell membrane with special reference to metabolism and transport of substances into and out of the cell are being correlated with other properties of the membrane.



The latest model electron microscope is used to explore the lving cell at the molecular level by biophysicists in the Department of Biology.

Medical Press, Inc.

Nucleic acids have become the focal point of interest for biophysicists, biochemists, microbiologists, and geneticists. The size, shape, and helical structure of the nucleic acids have been investigated, especially with the techniques of x-ray crystallography and electron microscopy. Their formation in the cell from purines and pyrimidines in the presence of appropriate enzymes is being studied in the biochemistry laboratories primarily utilizing radioactive tracer techniques. The interest in nucleic acids from the biologist's point of view centers at the present time on their role in the viruses and the genes within the chromosomes of the cell. A genetic study of such materials is rapidly yielding information which can be correlated with that furnished by the biophysicist and biochemist. The viruses are almost ideal molecules for simultaneous study by many different disciplines and are becoming the focal point of many investigations in the Biology Department. Results applicable to medicine will doubtless be obtained from such diverse attacks.

Synthesis of Vitamins

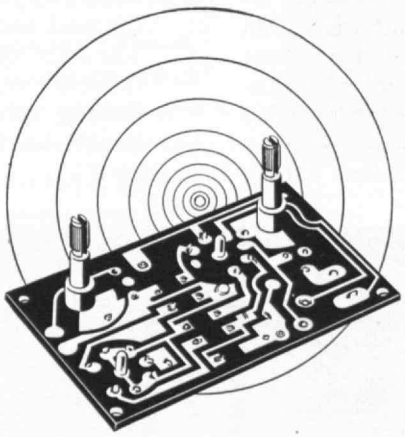
The synthesis of vitamins in bacterial cells in particular is receiving attention from the biochemists. In addition to such studies in biosynthesis, the role of vitamins as active groups of enzymes is being elucidated. Antibacterial agents are being studied particularly with reference to their mechanism of action against microorganisms and also as anticancer agents. At the basic level the role of antibiotics and other pharmaceutical agents is being investigated from the point of view of the mechanisms whereby such drugs act as specific inhibitors of certain enzyme systems. Such inhibitors are already finding major use in agriculture and medicine. Many enzymes are receiving attention in the biochemical laboratories, especially those which are involved in the metabolism of amino acids. These include the enzymes of transamination and amino and hydroxy acid oxidation. Physical chemical techniques are being applied

(*Concluded on page 440*)

BUSINESS IN MOTION

To our Colleagues in American Business . . .

"Printed circuits!" "Printed circuits!" You hear it on all sides today. And well you might. For printed circuits have so many advantages. They have compactness as compared to conventional wiring and compactness that makes possible better assembly arrangements and techniques. Numerous, time-consuming hand operations are eliminated, there are fewer rejects, shorter, less intricate assembly lines, and fewer soldering operations, as with printed circuits a single dip-soldering operation can solder all joints at once.



Revere, naturally, has been interested in printed circuits from their very inception. So Revere Research Engineers immediately went to work to perfect a copper that would meet all of the rigid requirements encountered in manufacturing printed circuits as well as those necessary to their efficient operation. Accordingly, they set up these rigid specification standards: there can be no peaks or valleys. Surface must be hard and of uniform density through and through and side to side to maintain positive conductivity throughout the circuit. Also, a hard surface permits resist to clean off easily as there are no pores to hold resist and cause trouble later when soldering. Even the most closely spaced and finest lines encountered in a printed circuit must have a sharp definition of the edges and be freer from pits, pinholes and imperfections.

Also, the copper must be free from oxidation as it comes from the mill and without lead inclusions, present a sufficiently clean surface so that fluxes will wet readily and when automatically soldered the solder coat will be uniform every time . . . free of skips or bald spots. Copper-to-laminate bond strength must be uniform and adequate. Revere Rolled Copper also shall exceed standard specifications as well as meet ASTM B5 specification for purity with a 99.9% minimum rating.

Those were the rigid standards set up by Revere Research Engineers and those are the standards met by the Revere Rolled Copper now available in unlimited quantities. Said one laminator, after using Revere Rolled Copper, "It enables us to give our customers superior copper-clad laminates that present a smoother surface (freer from pits, pinholes, and imperfections) . . . more uniform thickness without sacrifice of conductivity. The result has been, consistently satisfactory etching at better production rates."

And, because you can get all the advantages of Revere Rolled Copper at no extra cost it will pay you to make absolutely certain that you specify Revere Rolled Copper for your printed circuits when you order your boards from your laminator.

But, whether you order Rolled Copper from Revere or other materials furnished you by other manufacturers . . . the best results and the greatest satisfaction are obtained only when you take your suppliers into your confidence.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: **230 Park Avenue, New York 17, N. Y.**

(*Continued from page 422*)

of possible values. Sometimes the system will be found insensitive to a particular quantity and its value is thereby shown to be unimportant. If the system is highly sensitive, additional effort can be put into determining the correct value or, at the very least, the risks of not knowing become apparent.

Summary and Future

I have sketched a new, basic framework for studying the management process. It should help tie together the various separate management techniques, and help in relating the parts of a company to one another, and the company as a whole to its surrounding environment. This new framework, which will be developed in the next few years, will be based, not on the functional divisions like manufacturing, sales, accounting, and engineering, but on the underlying fundamental movements of materials, money, and labor, all tied together by the information flow and decision-making network. The essence of industrial behavior will be recognized as the way the money, materials, man power, and information networks interact to cause continuouly changing patterns within the company. This new view of the management process might be called "industrial dynamics." Industrial dynamics will treat the time-dependent interplay of changing forces acting on the company – the effect of information sources, decision criteria, time delays, and feed-back characteristics, on company success. Industrial dynamics will combine the four basic flow patterns of information, money, materials, and man power to permit an over-all "systems approach" to the industrial organization and its future trends.

There are five objectives in developing a better understanding of the interplay of forces within a company and the company's reaction to external influences:

1. Developing in the manager or management student a better intuitive feel for forces creating change, either long-range growth or short-range fluctuations;
2. Providing a unified framework within which a manager can relate his training and experience to the total system;
3. Understanding the nature and behavior of an existing organization;
4. Predicting the response of an existing system to changing external conditions;
5. Finding new forms of organization or different decision criteria to produce more successful operation.

Industrial dynamics should provide an improved basis for predicting company performance. The future of most companies for the next two, three, or even five years is already fairly well determined by the past and present forces acting on the company. The stability of trends and the resistance to change is tremendous at the level of the fundamental, controlling influences such as the company organizational structure, information channels, time delays,

(*Continued on page 430*)

Dr. Lloyd P. Smith

President, Avco Research and Advanced Development Division

speaks out about AVCO . . .

AND THE RACE AMERICA MUST NOT LOSE

Our greatest aim is to make truly significant scientific discoveries and technical developments. Discoveries which add to our scientific knowledge. Discoveries and developments which lead to new products which can be produced for the good of mankind and insure our continued economic prosperity. Discoveries and developments which will maintain the nation's defenses strong. Most of all, to make discoveries and technical "breakthroughs" which will give our country the scientific and technical leadership and prestige which are so essential for maintaining the peace of the world. We fully realize that to attain these objectives we must win out in a great scientific game against a competent and ambitious adversary.

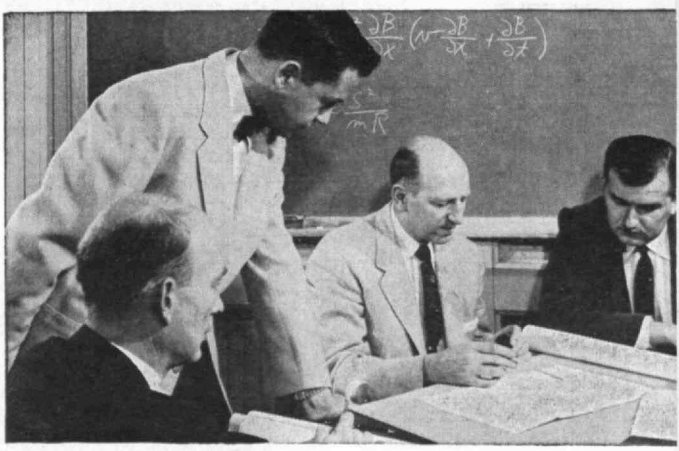
The Avco Research and Advanced Development Division, with its team of creative scientists and engineers, is expending great effort to reach these goals. Significant accomplishments have already been made in the physics, chemistry and gas dynamics associated with the high-altitude, hypersonic flight of missiles; the intercontinental ballistic missile re-entrance problem; missile stability; and electronics as applied to advanced radar, computers and air navigation.

New fields are under investigation and the division hopes to make technical "breakthroughs" in magnetohydrodynamics, controlled thermonuclear fusion, conversion of chemical and nuclear energy into useful work, the creation of new materials, the manned satellite, and many other areas. Some of these fields are so new that our laboratories must also be teaching centers so that young scientists and engineers who join us can learn the science and technology basic to these new fields while contributing their own creative investigations.

Lloyd P. Smith

Pictured below is our new Research Center now under construction in Wilmington, Massachusetts. Scheduled for completion in early 1958, this ultra-modern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

Dr. Lloyd P. Smith



A new idea is nourished by exposure to men representing many different scientific specialities—a characteristic operating method at Avco Research and Advanced Development Division.

Avco's new research division is now offering unusual and exciting career opportunities for exceptionally qualified and forward-looking scientists and engineers in such fields as:

SCIENCE: Aerodynamics · Electronics · Mathematics · Metallurgy · Physical Chemistry · Physics · Thermodynamics

ENGINEERING: Aeronautical · Applied Mechanics · Chemical · Electrical · Heat Transfer · Mechanical · Reliability · Flight Test

Write to Dr. R. W. Johnston, Scientific and Technical Relations, Avco Research and Advanced Development Division, 20 South Union Street, Lawrence, Massachusetts.

avco | **research and advanced development** division

SYSTEMS TECHNOLOGY

(*Continued from page 428*)

research and development policy, competitive position of machinery and processes, products now in the research and engineering laboratories, financial structure, basis for production and inventory decisions, advertising policy, and the distribution system. These relatively stable underlying characteristics of the company are manifested in seemingly erratic fluctuations of the more superficial quantities like inventories, sales, manufacturing rates, profits, and growth.

Now, where do we go from here? In a number of companies and institutions, one already sees a developing awareness of this area I call industrial dynamics. It has not yet coalesced into an organized field of endeavor.

Here, at the M.I.T. School of Industrial Management, we are just crystallizing our own research plans. I think industrial dynamics will become one of the principal research areas of the school, and we will develop it as rapidly as financial resources permit. In April, International Business Machines Corporation installed a 704 computer here at M.I.T., and we will use it for the simulation of industrial operations. We have a half dozen men now beginning work in formulating the structure of industrial systems; we should try to increase the number to 30 or 40 within three or four years.

It will be mandatory that we work closely with industrial companies on their real problems. This is an area which cannot be developed as an "ivory tower" study. It must represent the real processes, the political forces, the decision factors, and the actual, not the ideal, functioning of an organization of people. Perhaps the Management School should arrange to borrow a few men from industry, for a year each, to provide the industrial contact. They would help develop new ideas and take them to their companies.

In about five years I foresee the transition from research to the use of these new methods as a practical tool for company management.

These new concepts will develop more quickly than might normally be expected. They will fill a pressing need already recognized in industry. Their power will give a significant competitive advantage. Also, many companies are already developing the background skills that will be needed. Computers that are now being acquired for other purposes can be used. Operations research departments can expand into the broader management systems studies. Simulation techniques, feed-back control system theory, and analysis of decision processes are being developed in the engineering departments of many companies.

Research on broad, over-all management problems must be started within individual companies. More companies fail from poor management than from poor engineering. Yet, we have the anomaly of thorough systems studies on products and almost none on the behavior and future prospects of the company itself. Research on devices is fashionable. Research toward better management has yet to be fully appreciated.

Someone is sure to ask what these new developments mean to the manager and his place in the com-

(*Concluded on page 432*)

Hot Water

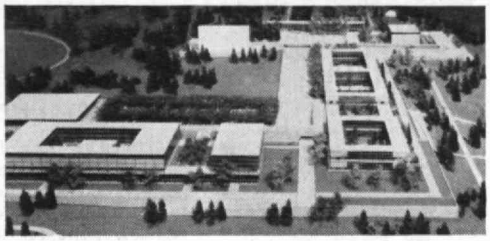
One of the three C-E LaMont Hot Water Boilers being installed at Forbes Air Base, Topeka, Kansas.

TODAY'S NEW IDEA IN BIG-SPACE HEATING

Maybe hot-water heating doesn't sound like a new development to you. But it may be news to you that water at very high temperatures – up to 470° F and 500 pounds pressure – is coming to the fore as an advantageous method of heating large areas.

A big factor in bringing this trend about is the C-E LaMont Controlled Circulation Hot Water Boiler. Using the same principle applied by C-E in many of the country's largest utility boilers, this new boiler provides a degree of temperature control that makes it the most attractive method of heating in many cases. Examples of highly successful applications are industrial plants, large institutions, air bases and other military installations.

There are many cases, of course, where steam may still be the best choice. But here is an important point: whichever may be best for you, C-E, with its complete line of boilers of all types, can supply the equipment best suited to your particular situation. And, Combustion's wide experience is available to you and your consultants in finding the right answer. For details on C-E high-temperature water boilers, write for Catalog HCC-2.



Model of the country's newest service school, the U. S. Air Force Academy at Colorado Springs, where five C-E Hot Water Boilers will serve living, academic and service areas. Recognition of this system's advantages is shown by the fact that this same type of equipment is in service or on order for such Air Force Bases as Dover, Portsmouth, Forbes and McGuire . . . for industrial plants like Convair Astronautics Div. of General Dynamics Co., The Cross Co., Erie Mining Co. and Marquardt Aircraft Co. . . . and for such institutions as the A. E. Smith High School in Riverview, Mich.

COMBUSTION ENGINEERING

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(*Concluded from page 430*)

pany. Is this automatic management? Do I suggest that management can be replaced by machines and formulas? The answer is, of course, emphatically to the contrary. It means that management will have additional tools. The new tools will assist, but only to the extent that the manager has the skill to use them. Just as automation requires new skills at the worker level, so will improved methods require new training and abilities at the management level.

We can expect changes in various management responsibilities. There may be a merging of certain line and staff characteristics at the top management levels. An understanding of industrial system dynamic behavior will assist in policy decisions of utmost importance to future company success and is, therefore, a top management responsibility. At the same time, systems planning is by nature a thoughtful process of weighing the past and present, not to answer the immediate decision of the moment, but to derive guiding principles for the future. The new developments will support the trend toward separation of policy making and operation with the dividing line at a lower point in the organization than at present.

The new information flow developments in the company will strongly support the movement toward decentralized management. In the past, centralized management with power concentrated at the top has resulted from an effort to get systems integration and over-all control. With a better understanding of system dynamics, we can expect improved policy formulation to encourage lowering the management level of operating decisions. Managers at the lower levels will have the training and information to see how their actions affect the over-all company goals. With this will go improved evaluation criteria for measuring the performance of a manager in such a way that his personal objectives coincide with the objectives of the whole company.

The future operating manager will be less concerned with day-by-day decisions on manufacturing schedules, advertising, inventory, and cash flow as these become more organized and systematized. Viewing the company as an integrated dynamic system is to view it as a form of a continuous process control system in which information flowing in the normal channels, and the repetitive decisions derived from this information, are handled as part of the system design. This will free more of the operating executive's time for management by exception. He can give more attention to the truly special or unusual kinds of information — the effect of external political affairs, or the inside tip on a competitor's forthcoming new model. He will also have more time for the individual aspects of human relations. Individual motivation, communication, happiness, and job satisfaction will become increasingly important to the line supervisor.

As the manager becomes less concerned with the routine, repetitive operating decisions, he will become more concerned with the unusual, the exceptions to normal operation, with innovation in products, and with the human side of enterprise.

Another M. I. T. Man-on the way

Remember when it was you standing there? How you squirmed when your father saw that one bad report card. You're glad now that he made you buckle down — grateful that you were able to go on to one of the country's finest universities.

Naturally, you want to be just as farsighted about your own son's future. So now that he's one year closer to college — wouldn't it be wise to call your Massachusetts Mutual man and discuss the best insurance plan for his education?

And since this is the time for report cards and review, perhaps you should re-evaluate your own career. Are you as far along as a man of your ability should be? For example, are you earning as much as $12,490 a year? That was the 1956 average income of 562 representatives who have been with the Massachusetts Mutual Life Insurance Company five years or longer.

They are men like you — men chosen for their fine education and background. All received thorough training and earned while they learned. Now they are established in a career that uniquely combines independence with stable income—plus the security of group insurance and retirement benefits.

If you would like to know more about this opportunity, write for a free copy of "A Selling Career".

Massachusetts Mutual
LIFE INSURANCE COMPANY
SPRINGFIELD, MASSACHUSETTS
The Policyholders' Company

1851

TOMORROW'S MANAGERS

(*Concluded from page 411*)

I shall add just three more comments and then I shall be done.

First, I am sure no one here has misunderstood me, but I want to make it crystal-clear that in urging wide-open paths to self-development, I am certainly not advocating greasing the ways for anyone. Quite the contrary. Really what I have been saying is that more men will do more growing as we give them the most opportunity to take the most exacting path. After all, it is harder to become everything you can be than it is to do anything else.

Second, I have not forgotten competition either: I mean the competition between people in any organization, the matching of brains against brains. We have always had this in American industry and the value is beyond calculation. Freedom to compete produces not only a better leader, but a better group for him to lead. It promotes competence through the whole organization, not just at the top. It constantly refreshes and renews the entire management stream.

But the great value is not alone in the fact of competition; it is even more in its quality. For example, we might get plenty of competition on the part of people trying to see who could conform most completely with all the rules and regulations, but that is not what we are after. Only as we succeed in giving men full and free opportunity to become their complete selves, are the benefits of competition fully realized.

Finally, our social institutions and all our history tell us that the right way to live and work and achieve is to give men real freedom to become all they can be. The approach I have been trying to express seems to me distinctively American. We have put fewer obstacles in the way of talent – obstacles of birth, of education, of money, of class – than other nations have. This country has grown great and our industry leads the world because here more than elsewhere we have acted on the conviction that everybody ought to have full opportunity to show what he can do.

This is our faith as Americans: faith in the process of human growth, which we only dimly understand, and cannot dictate. With this faith, we *will* continue to build and enlarge the kind of business climate that grows great men; and this achievement, I feel sure, will be our own deepest and most satisfying reward.

FINANCIAL FORCES IN INDUSTRIAL GROWTH

(*Continued from page 416*)

as the individual capital budget is a framework for the future of the individual company, the aggregate of such budgets is a framework for the future of the economy. Taken together, these decisions determine to a considerable extent the pace and process at which the productive capacity and standard of living of a nation will grow.

SEARCH FOR INVESTMENT OPPORTUNITIES

A company's long-range planning should include a creative search for investment opportunities and a flexible and understandable blueprint through which its growth potentials can be charted as an explicit guide to all concerned.

A plethora of good investment projects is essential to any capital investment program. The worst that can happen from too many good investment opportunities is that a company may not make some of these investments. On the other hand, a lack of good investment projects may lead to wasting money in low profitability projects. The same money can often be put to better use elsewhere; the problem is finding projects of higher profitability.

The most important factor in this search for new projects is good management. Since most new projects come from trying to find better ways of doing things, they come rather automatically in a managerial climate wth a fair amount of autonomy and freedom.

SEARCH FOR NEW PROJECTS

There also must be a conscious search for new projects. A major source is the research department, whose primary purpose is to discover new or improved products and methods; these in turn become the basis for new projects. Efforts of the industrial engineering team to find ways of reducing costs may turn up opportunities for projects with promise of high productivity. Economic analysis may yield insight to expanding areas and markets.

(*Concluded on page 438*)

ENGINEERS

get in on the military electronic advances

TODAY

that pave the way for commercial developments

TOMORROW

at the Otis Electronic Division

The full resources of the century-old Otis Elevator Company are available for expansion of its new Electronic Division. And engineers who join this division now will have the satisfaction of working in the forefront of the military electronics field . . . with the realization that its potentialities in commercial development will also be explored by Otis . . . that this is a long-range program in which Otis will spare no effort in broadening the position of its Electronic Division as a leader in this important field of industry.

Current prime contracts are on basic development work in the most advanced areas of bombing navigation systems, radar systems and missile launching test equipment.

Engineering know-how is required in servo-mechanisms, analog computers, pulse and sweep generators and in the field of microwaves.

If you are interested in a high level career in electronics . . . with promotions waiting to be earned . . . send your resume now to William B. DeFrancis. All inquiries in strict confidence.

ELECTRONIC DIVISION

OTIS ELEVATOR COMPANY

35 Ryerson Street, Brooklyn 5, N. Y.

FINANCIAL FORCES IN INDUSTRIAL GROWTH

(*Concluded from page 436*)

The first step, then, in a good capital budgeting program is to create an organization that will build up an abundance of high return investment possibilities. A subsequent step is to embody ideas produced by such an organization into an understandable and defensible long-range plan.

Long-range planning is important in any modern system because capital projects commit a company to the distant future. Not only do capital projects have a long gestation period, but they also have a long period of life. Secondly, individual capital projects must be fitted in a company's development of its people. Long-range planning helps overcome imbalance or bottlenecks in production or distribution that arise from haphazard programming. It also forces an explicit estimate of how management views the future.

Fortunately, in a growing economy long-run mistakes are covered by absolute growth. But even though the economy may continue to grow, capital budgeting should not be done in a careless fashion.

The short-range annual capital budget should serve as a central clearing mechanism for allocating funds among competing uses. In order to achieve optimum results, there is need for a clear-cut procedure for submitting, processing and auditing capital expenditure proposals.

Departmental estimates made in connection with individual appropriation requests should be understandable and defensible. Similarly, decisions made in the central capital budget should be understandable and defensible ones. For accepted proposals, actual project outlays and benefits should be compared on a periodic basis against original estimates. Such a postmortem on authorized outlays is necessary in order to keep departmental estimates realistic. It also provides a basis on which techniques for projecting sales, costs and margins might eventually be assayed and improved.

Summary

By way of summary, I do not believe that private capital formation necessary to maintain the long-term average annual rate of increase in per capita real income will be inhibited by a shortage of funds over the next decade. The terms of financing, however, will be more restrictive in the years ahead than was true of the postwar period. It is obvious that efficiency always provides an advantage. What I am trying to say is that the extent of this differential advantage is going to increase markedly in the future. Thus the business firms with more efficient financial management will enjoy greater advantages over their competitors in the future than has been true for the last 25 years.

Here's how Haspel makes you comfortable even in the hottest summer weather . . . .

Sir Perior Suits and Jackets

(75% DACRON 25% COTTON)

an exclusive Selfcaire® fashion

No other suit boasts so many advantages! The smart fashion that gives you such a distinguished appearance lasts and lasts . . . through the most wilting weather, carrying you in crisp, cool comfort . . . through innumerable launderings, with no special care required. You simply suds, rinse and drip-dry on a wooden hanger. It "irons" itself . . . is impeccably ready to go the next morning.

SUITS 39.75

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Prado Cord Suits and Jackets

Here is the suit that has become a summer tradition with the well-dressed men everywhere. The reasons are many. One is that the cool, crisp cotton fabric, specially treated for wrinkle-resistance, is wonderfully comfortable on hot days. Another is the incomparable HASPEL taste, talent and technique. And, of course, the smart styling of Prado Cord gives every man a slimmer, more flattering appearance. And, of course, it's washable.

SUITS 28.75

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Join — Buy

Save

8% or 10%

THE COOP

Harvard Square

LIFE SCIENCES

(*Concluded from page 426*)

to the study of proteins and the mechanism whereby protein molecules aggregate and associate under certain conditions. Special attention is being devoted to the formation of fibrils from the aggregation of corpuscular insulin molecules, and, in addition, the mechanisms of blood and milk coagulation are being investigated by physical chemical methods. These laboratory studies on amino acids and proteins should yield information concerning their role in living organisms.

In the field of embryology, focused ultrasound is being used as a surgeon's scalpel at the cellular level to determine the role of various cells and tissues in embryonic development. These same techniques of focused ultrasound make possible the localization of malignant tumors in the human body.

In the biological Instrumentation Laboratory, research is centered on the development of electrical instruments for use in biology and medicine. At the present time, special attention is being given to the development of a sensitive two-dimensional parallel plane Geiger counter with a photographic film to be used primarily for the detection of x-rays.

The Biology Department, in addition to its research program, provides a major center for training of students in the biological sciences. Both graduate, undergraduate, and postdoctoral students are trained in the techniques of research with the result that the majority of students who receive degrees in biology undertake research careers in medicine, in academic institutions, or in industrial and government laboratories.

In view of the large number of research projects in the life sciences scattered throughout the Institute, the question arises as to the mechanisms whereby these programs are integrated and correlated. In the last few years they have evolved almost spontaneously in many different areas, as unique facilities in the physical sciences and engineering became available for the solution of biological problems. Since these studies have evolved quite independently there has been relatively little correlation of projects in the life sciences in one department with those in another. There is no thought, at the present time, of bringing all of the research in the life sciences under one central organization. On the other hand, M.I.T. is interested in encouraging in every way the growth of research in this area and is anxious to have a particular research project in one department not develop in isolation, but rather to benefit from contacts with research workers in other departments who are interested in related problems. Different ways of implementing the co-ordination of the life sciences are being investigated, and, in particular, joint seminars are being set up and informal discussions arranged for the better co-ordination of research in related areas. There can be no doubt that all the various projects at M.I.T. will benefit from this cross-fertilization of ideas among the many research groups, and that investigations in the life sciences will develop at an accelerated pace as a result.

Pattern of Research in Life Sciences

In an examination of the 117 research projects in the life sciences at M.I.T., one is most impressed by their diversity, and wonders if there is any basic pattern of research in this area. Certainly many aspects of the life sciences are not covered. Fields such as botany, agriculture, morphology, anatomy, ecology, and many other types of biology stressed in other institutions are not represented here. The pattern of research in the life sciences shows a strong influence of the basic sciences, particularly mathematics, physics, and chemistry, as well as the fields of engineering, on the type of investigation going on at M.I.T. Just 20 years ago there was organized a new field called Biological Engineering by three progressive and far-sighted scientists: the late Karl T. Compton, formerly President of the Institute; John W. M. Bunker, Dean of the Graduate School, Emeritus; and Vannevar Bush, '16, Chairman of the M.I.T. Corporation. In developing this new type of biology it was their intention to see the application of science and engineering to teaching and research in the life sciences. It is just this type of biology which has developed throughout the Institute over a score of years and it seems to ideally set the pattern for research in the life sciences for years to come. It is not too optimistic to expect that M.I.T. will become one of the major centers in the world for research in the life sciences as a result of the application of this concept over the next decade or so.

INDUSTRIAL MANAGEMENT CONVOCATION

(Concluded from page 408)

Management is gradually becoming a profession, Dr. Bush held, with all that that term connotes. Directors need not abandon the interests of stockholders, but they need to widen their horizons so that this is not the only view they see.

Evening Session

The day's activities were concluded with a social hour and banquet at the Hotel Sheraton Plaza in Boston. James R. Killian, Jr., '26, as M.I.T. President, presided, and Alfred P. Sloan, Jr., '95, Honorary Chairman of the Board of General Motors Corporation, was guest of honor. The Reverend Theodore P. Ferris, Rector of Trinity Church, Boston, and a member of the M.I.T. Corporation, gave the invocation. Cleo F. Craig, Chairman of the Board, American Telephone and Telegraph Company, made the principal address, "Tomorrow's Managers."

Following the dinner, Dr. Killian spoke on the history and significance of the School of Industrial Management. He remarked that while some may have had some doubt about the School of Industrial Management at the time of its founding, "now, five years later, we look with parental pride and enthusiasm at our newest school." Mr. Sloan not only provided the funds which made the new school possible, said Dr. Killian, but "he has set for it a standard of performance and a vision of greatness. He has brought wise and creative thinking to our councils; he stands as a towering example to our Faculty and students. We salute him for what he has done and for this school, for M.I.T. and for his country."

To the introduction given by Dr. Killian, Mr. Sloan responded by stating his view that the convocation of April 9 marked a milestone in the evolution of the School of Industrial Management in which it had been a privilege to participate. Mr. Sloan remarked that "we have reached or already surpassed the goals Dr. Compton and I foresaw for the School." This has been possible, he said, because of the brilliant leadership provided by Dr. Killian and Dean Brooks, and the generous contributions of many industrial leaders who served as able advisers in the development of the School's curriculum. "I have found," said Mr. Sloan, "the discipline of science and engineering of immense value as chief executive officer of the General Motors Corporation. The industrial leaders of the future will be still more certain of the value of the technological background for management. It is M.I.T.'s responsibility to be a leader in the developments such as this."

The last event of the day's program was the address by Mr. Craig, "Tomorrow's Managers," which the reader will find reproduced on page 409.

By 9:30 P.M., the convocation was over. Those who were fortunate enough to attend the day's events may have taken back to their homes a new conception of modern methods of training managers for the industrial society of tomorrow. But all shared in the hopes and aspirations of a great educator and of a great industrialist — Karl T. Compton and Alfred P. Sloan, Jr., '95.

and the prophet replied:
"It is well to give when asked, but it is
better to give unasked, through understanding." *

Gifts by Will

TO THE

Massachusetts Institute of Technology

The tale is told of Almustafa, the prophet, who, having awaited for many years the ship that would return him to the place from whence he came, was making the final descent to the shore when the folk of Orphalese crowded about him. They besought him before departing to "disclose us to ourselves, and tell us all that has been shown you of that which is between birth and death."

With words of wisdom, an answer appropriate was given to the woman holding a baby, to the ploughman, to the merchant. Begged one, "Speak to us of GIVING," and the prophet replied:

> "It is well to give when asked, but it is better to give unasked, through understanding;
> And to the open-handed the search for one who shall receive is joy greater than giving. All you have shall some day be given;
> Therefore give now, that the season of giving may be yours and not your inheritors'."

Through the years the prophet's words have held true, for even today he who "through understanding" includes the MASSACHUSETTS INSTITUTE OF TECHNOLOGY as a beneficiary in his will can experience thereby a two-fold satisfaction. The successful culmination of his search for a worthy recipient and the anticipated results his generosity will assist in accomplishing. These satisfactions give an added value to the span of man's days and project his usefulness to his fellowmen far into the future.

The Massachusetts Institute of Technology because of the high quality of the education given its students, its effective research work for aiding America in peace as well as in war, and the high character of its governing body and academic staff qualifies as an institution for serving our American ideals for the present and in the years to come.

But the search, the finding, and the anticipated accomplishments are not enough; for without the properly-worded record, man's plan for the future may go awry. Hence the prophet's importuning, "—give now," should be heeded. The giving need not be an immediate physical transaction, for written directions replace the spoken word when the speaker is no longer present, and a donor can frequently make by will a gift which is larger than he can make while living. Truly, *"it is well to give when asked, but it is better to give unasked, through understanding."*

A booklet "Gifts by Will," outlining different forms of bequests to M.I.T., is available to you or to your attorney by writing to:

Director of Development
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

* "The Prophet" by Kahlil Gibran

ALUMNI AND OFFICERS IN THE NEWS

New Posts . . .

In addition to the 31 Alumni elections and appointments recorded on page 398, other Alumni recently advanced are enumerated below:

JOHN A. BIGELOW'11 to membership on the City Planning Board of Marlboro, Mass. . . . EDWARD L. MEARS'30 to manager of the Central Services Division of Dewey and Almy Chemical Company . . . JULIAN P. HASTINGS'31 to the Board of Assessors of Framingham, Mass. . . . JOHN E. KEARNS'32 to manager of the District Sales Office at San Francisco of the Bristol Company, Waterbury, Conn.

FLETCHER S. BOIG'33 to associate professor of chemistry at Northeastern University . . . BERTRAND E. BENNISON'37 to assistant director of the Medical Research Division, Esso Research and Engineering Company . . . GEORGE W. EWALD'37 to manager of the Textile Division, Industrial Sales Department, Celanese Corporation of America . . . ALLAN J. WILSON, JR.,'38 as a director of the Reliance Cooperative Bank, Cambridge.

LOWELL T. BROWN'42 as a director of the American Association of Industrial Editors . . . BERNARD E. ERICSON'42 to assistant to the vice-president for engineering of Pittsburgh Steamship Division, United States Steel Corporation . . . E. ALFRED BURRILL, JR.,'43 to sales manager of High Voltage Engineering Corporation . . . DONALD A. HURTER'46 and A. GRAHAM STERLING'48, respectively, to manager of quality control and production control superintendent of the Nuclear Products Division, Metals and Controls Corporation.

ALEXANDER ALDRICH'48 to secretary of the Police Department of New York City . . . ROBERT A. GINIVAN, JR.,'48 to personnel manager of the Everett, Mass., plant, Monsanto Chemical Company . . . GERALD G. FISCH'50 to vice-president of Bruce Payne and Associates, Inc.

Books . . .

The Technique of Executive Control by ERWIN H. SCHELL'12, Professor of Industrial Management, Emeritus, Lecturer. A manual which makes a constructive analysis of executive administration. Supplies a systematic guide whereby the executive may measure his own procedures against a general pattern of recommended practices. (New York: McGraw-Hill Book Company, Inc., eighth edition, 1957, 300 pages, $4.75.)

Let ERMA Do It by DAVID O. WOODBURY'21. A discussion of the development of automatic devices and techniques in relation to the concomitant social and economic changes. The thesis is advanced that automatic manufacturing and accounting or computing processes have not displaced human workers – they have freed them for more skilled occupations and better pay. The second part is a description of several of the outstanding electronic devices in current use, or now being developed, such as UNIVAC, ENIAC, MANIAC, SAGE, RAM, and MAGGIE. (New York: Harcourt, Brace, 1956, xiv plus 305 pages, illustrated, $5.00.)

Applied Mathematics in Chemical Engineering by THOMAS K. SHERWOOD'24, Professor of Chemical Engineering, CHARLES E. REED'37, and HAROLD S. MICKLEY'46, Associate Professor of Chemical Engineering. A consolidation of the methods of applied mathematics into a form that can be readily used by both student and chemical engineer (New York: McGraw-Hill Book Company, Inc., second edition, 1957, 460 pages, $8.50.)

Audubon Western Bird Guide by RICHARD H. POUGH'26. The newest of his series of books on the birds of America. (New York: Doubleday and Company, Inc., 1957, illustrated, $4.95.)

Basic Electrical Engineering: Circuits, Machines, Electronics, Control by ARTHUR E. FITZGERALD'31 and DAVID E. HIGGINBOTHAM'48. This revision gives greater importance to modern control and measurement techniques and incorporates recent developments and concepts in circuit theory, machines, and electronics. (New York: McGraw-Hill Book Company, Inc., second edition, 1957, 545 pages, $7.50.)

Applied Metallurgy for Engineers by MALCOLM S. BURTON'43. Develops the metallurgical principles involved in casting, metal working, welding, heat treatment, and powder metallurgy, and studies these manufacturing processes from an engineering viewpoint. (New York: McGraw-Hill Book Company, Inc., 1957, 407 pages, $7.50.)

Mechanics for Engineers by E. RUSSELL JOHNSTON, JR.,'47 and A. Ferdinand P. Beer. Helps the engineering student develop the ability to analyze a practical situation and to apply to its solution a few, well-understood, basic principles. Designed for the first courses in statics and dynamics. (New York: McGraw-Hill Book Company, Inc., 1957, 673 pages, $6.50.)

Flotation by ANTOINE M. GAUDIN, Richards Professor of Mineral Engineering. An analysis of the foundations, technology, and applications of the flotation process for the separation of dissimilar fine solid particles. (New York: McGraw-Hill Book Company, Inc., second edition, 1957, 560 pages, $12.00.)

The National Bureau of Standards has begun preparation of a *Handbook of Mathematical Tables*. In addition to the elementary functions, the *Handbook* will cover almost the entire field of transcendental functions. Expected to be ready before the end of 1958, it will have about 1,000 pages – 750 pages of tables, 50 pages of graphs, and 200 pages of text.

The need for such a handbook was originally discussed at the Conference on Mathematical Tables held at M.I.T. in 1954. The present project is a result of the recommendation of the Conference that the National Science Foundation support the preparation of a handbook by the National Bureau of Standards.

PHILIP M. MORSE, Professor of Physics; Director of Computation Center, is chairman of the committee, and ROBERT D. RICHTMYER'35 is a member.

Obituary

FRANK CHENEY, JR.,'82, March 31
RICHARD S. LULL'85, April 22*
EDWARD HAFER'92, September 5, 1956*
HENRY S. BALDWIN'96, April 4*
JAMES L. HOWE'96, December 20, 1955*
ARTHUR S. DEWOLF'97, February*
ELWELL F. KIMBALL'98, March 28
HERMAN H. SMITH'99, March 3*
LAWRENCE G. COBURN'02, March 11*
W. MERTON RICE'02, March 26*
DAVID S. REYNOLDS'03, March 31*
WILLIAM F. ENGLIS'06, March 23*
ATTWOOD E. RIPPEY'06, January 6*†
FREDERIC E. BANFIELD, JR.,'07, March 19*
WILLIAM S. LUCEY'07, February 28*
MASANAO YENDO'07, 1942*
HORACE L. CLARK'09, March 3*
WILFRED S. HALE'09, March 1*
WILLIAM R. REILLY'09, January 9*
SILAS H. CHAMPLIN'13, January 22*
CHARLES F. HAGLIN'13, March 4*
MORRIS M. LEONARD'13, June 13, 1956*
ALBERT P. NELSON'13, December 31, 1956*
SHERMAN R. RAMSDELL'13, January 9*
ROBERT O. RIDER'13, December 18, 1956*
HENRY C. SHEILS'15, March 22*
FRANK D. CHANDLER'16, March 28*
JOHN H. CHASE'18, February 7*
VINCENT S. HARRIMAN'18, January 23*
EDWIN M. NEWTON'18, February 13*
CLARECE E. RICHARDS'18, March 4*
JOHN A. SARGENT'18, January 8*
MAYNARD L. SMITH'18, May 13, 1955*
THOMAS H. FROST'21, February 4*
SIMEON E. TRAVIS, JR.,'21, March 10*
MARCUS A. MCCLURE'22, December 1, 1954*
GEORGE L. BROWNING'23, November 27, 1956*
JAMES W. PRATT'23, February 20*
WILLIAM F. DONOVAN, JR.,'24, March 11*
HERBERT A. LAFLER'25, March 17*
JOSEPH B. SAUNDERS'25, March 5*
MILAN F. TANDY'28, February 18*
CHARLES B. CONWELL'31, April 1
FREDERICK W. WEHMILLER'33, March 27*
LAURENCE G. FOX'53, March 13

* Further information in Class Notes
† Also in 1905 notes

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Baltimore

A dinner meeting of the Club was held in the London Room at The Marylander on April 26, 1957. After an election of new officers and a report on the activities of the Educational Council, Ralph Thomas'13 showed his colored slides of Northern Scandinavia which everyone thoroughly enjoyed. Your secretary regrets that this issue cannot carry the results of this meeting. We are very happy to announce that on April 2 Dick Steiner'39 was named commissioner of the Federal Urban Renewal Administration. Dick did much for the slum clearance projects when he was head of the redevelopment in Baltimore, and we know he will prove himself in his new position. — R. J. PETERSEN'27, *Secretary-Treasurer*, 4007 Deepwood Road, Baltimore 18, Md.

Boston Luncheon

The M.I.T. Boston Luncheon Club meeting was held on March 21 at the Union Oyster House with Secretary-Treasurer of the M.I.T. Alumni Association, Donald P. Severance'38, as the speaker. Don gave an interesting talk on the activities of the Alumni Association, stating that the purpose of the Association is to further the well-being of the M.I.T. Alumni and to foster interest in the Institute among the Alumni. There are 93 M.I.T. clubs scattered all over the world. The 100th anniversary of the Institute is coming up in a few years, and a committee of Alumni has been appointed to study the type and magnitude of the observance of the coming occasion.

The M.I.T. Alumni Association directs its interest toward improving educational programs rather than promoting athletics as is done in many other educational institutions. For instance, the Regional Conference of M.I.T. Alumni was held at Tulsa, Okla., which attracted widespread interest on the part of educators, the newspapers, the public, and high school students. The Alumni Fund, which is currently contributed to at the rate of approximately $600,000 per year by approximately 12,500 participating Alumni, is expected to increase during the next five years to $1,000,000 per year participated in by approximately 25,000 Alumni. The intent of the Alumni Office is to promote a closer relationship between the Alumni and the Institute. — C. VINCENT VAPPI'48, *Secretary*, 240 Sydney Street, Cambridge, Mass.

Buenos Aires

The M.I.T. Club of Buenos Aires held the first 1957 monthly dinner meeting at the American Club of Buenos Aires on last Thursday, March 28. The meeting was in honor of the new member of the Club, Mr. Bernardo Kupferschmid, graduated last year.

The following members attended this meeting: Oscar L. Briozzo, Gerardo Cahn, German A. Frias, Mauricio Kibrick, Eduardo A. Lonardi, Antonio Marin, Marcelo J. Markous, Roberto J. Ottonello (Club President), Luciano A. Preloran, Calvin Reed, Claudio P. Segre, Segundo Vallejo, Pedro Vicien. — GERMAN A. FRIAS'40, *Secretary-Treasurer*, Rodriquez Pena 1934 — 2° P. Cap., Buenos Aires, Argentina, South America.

Buffalo and Niagara Falls

The M.I.T. Club of Buffalo and Niagara Falls had a very successful plant visit to the Bethlehem Steel Company in Lackawanna, N.Y., on March 23, 1957. Almost 60 persons were in attendance, including sons of Alumni, and all enjoyed seeing the open-hearth furnaces, a rolling mill for heavy I-beams, and the strip mill. About 25 of the members were able to meet for lunch at the Hotel Lackawanna before the trip, which took most of the afternoon. A committee headed by Dick Paul, under President Joe Bergantz, did a most able job in arranging this affair.

It is noteworthy that the consolidation of the Buffalo and Niagara Falls M.I.T. Clubs has resulted in renewed interest and vigorous activity. The season was opened last fall with an outing held August 21 at the Youngstown Yacht Club which featured cocktails and dinner, sailing in several Tech dinghies, and dancing later in the evening. About 40 couples attended and had an enjoyable time. Arrangements were made by a committee consisting of T. C. Dauphiné, Chairman, R. V. Horrigan, and G. E. Claussen.

One of the best meetings in years was the M.I.T. Brainstorm Dinner held October 29 at which Mr. Alex F. Osborn, Vice-president of Batten, Barton, Durstine and Osborn, and President of the Creative Education Foundation, presented the principles and procedures of brainstorming, aided by his staff. Almost 80 Alumni were present, and were divided into six groups which proceeded to brainstorm previously assigned problems. The results of these sessions were sent to the National Inventors' Council, which had agreed to cooperate with the M.I.T. Club in an experiment to ascertain whether volunteer groups could produce ideas which would serve as leads to solutions of specific problems of national defense. The meeting was arranged by J. E. Bergantz with the able assistance of Whitworth Ferguson, Meeting Chairman, and Mr. Osborn. — THONET C. DAUPHINÉ'35, *Secretary*, Calkins Road, Youngstown, N.Y.

Central New York

Our March 5 meeting at Sherman's Restaurant in Syracuse featured Professor Richard Doell of Tech's Geology Department in a talk entitled "Scientific Aspects of the International Geophysical Year."

Professor Doell, who was here through the efforts of the Alumni Association, explained how, during the I.G.Y., a very large number of measurements would be taken which would, among other things, permit scientists to determine the validity of two long-disputed theories. These theories are those of "continental drift," and "polar wandering." The first theory concerns itself with the formation of mountains, such as those found on our West Coast, and the second theory is that the earth's magnetic poles have a fixed point about which they wander in some periodic fashion. It is known that the magnetic poles have shifted as much as 180 degrees in the last 60 or 70 years, but the laws governing this motion are not as yet understood. This year, for the first time, measurements of position and direction of the earth's magnetic field will be made in such numbers and with the required degree of accuracy and simultaneity to enable these two theories to be checked. M.I.T.'s part in the program will be mainly to set up the computer program necessary for analyzing the enormous quantity of data which will be collected.

In addition to a large turnout of our membership, we had as guests the following representatives of Syracuse's Central High School; Mr. Edward Broscoe, Vice-principal; Mr. Everett Ferris, Science Teacher; Mr. Bill Lamb, Senior Student; Mr. Bill Schmidt, Junior Student. Messrs. Lamb and Schmidt are prospective applicants for admission to Tech whose attendance at this meeting was arranged through Earle MacLeod'38, Educational Council member for their school. — GREGORY G. GEBERT'50, *Secretary*, 33 Trelign Drive, North Syracuse, N.Y.

East Tennessee — Knoxville

Your secretary had the honor of escorting a group of nine students from the Institute, ranging from undergraduate to post-doctoral, on an inspection trip to two river projects in this area on March 28. The occasion was a tour made by foreign students, representing Germany, Japan, Switzerland, and Venezuela, with one from Puerto Rico, to see some of the work of the Tennessee Valley Authority and other major organizations here.

The students heard introductory talks by T.V.A. officials, and were shown the Hydraulic Laboratory at Norris where the new Wilson Dam lock, with the

highest single lift and largest volume of any lock in the world, is being tested at a scale of 1:16. Completed T.V.A. projects visited were Norris, Watts Bar, Fontana, and Watauga Dams, and the Kingston Steam Plant. The students were also shown a test-demonstration farm and heard from the lips of a native farmer how the soil conservation and fertilizer research program of T.V.A. had brought farmers from their poverty-stricken condition of 25 years ago into economic security. The Oak Ridge National Laboratory and the Atomic Energy Commission's American Museum of Atomic Energy were visited. Your correspondent took the students, while en route to Fontana, to Chilhowee Dam which is under construction by the Aluminum Company of America as the fourth of a series of power projects on the Little Tennessee River. This will be in operation sometime in June. Our guide on this trip was Frank T. Wheby'52, employed on the staff of the resident engineer. — ROBERT FORBES'33, *Secretary,* T.V.A., 708 Union Building, Knoxville, Tenn.

Fort Worth

The M.I.T. Club of Fort Worth, Texas, held its regular quarterly meeting March 21 at the Cross Keys Restaurant and featured a talk by Mr. John Moody of the Gulf Oil Corporation who spoke on "How to Find Oil." The mixed group found many questions to ask as the mysteries of this highly interesting field were explained. A 20-minute color movie, "First Flight of the B-58," were also shown.

Mrs. S. E. Travis, widow of the late S. E. Travis, who died March 9, was voted an honorary life member of the Club in recognition of the energetic and constant support displayed by her and her husband through the years.

New officers were elected for the coming year as follows: George C. Grogan'48, President; James N. Patterson'50, Vice-president; and Loris M. Hailey'50, Secretary-Treasurer. Recognition was also given to the outgoing officers for maintaining a high degree of member interest and participation in Club activities. These officers were Ralph R. Uhmacher'31, President; George C. Grogan'48, Vice-president; and Eugenia Dritsas'25, Secretary-Treasurer. — LORIS M. HAILEY'50, *Secretary-Treasurer,* 2801 Creston Avenue, Fort Worth 15, Texas.

México City

The Ninth Annual Fiesta of the M.I.T. Club of México City took place March 14-16, and we were favored by a record attendance of 38 visitors from the United States, including our special guests of honor, Professor Jacob Den Hartog, Head of the Institute's Department of Mechanical Engineering, and Mrs. Den Hartog.

Our program began with an assembly for cocktails on Thursday, the 14th, at 1 P.M. at the University Club on the Paseo de la Reforma, after which the ladies were escorted for luncheon to the home of Alvino Manzanilla'31. Meanwhile, over 40 Alumni remained for their luncheon at the University Club. In the evening, at the Teatro del Bosque (Auditorio Nacional), Professor Den Hartog gave a lecture open to the public on "Present Research in Mechanical Engineering at M.I.T.," being introduced by Dr. Manuel Sandoval Vallarta'21, Under Secretary of Education for the Republic of Mexico.

The next evening came the traditional *Noche Mexicana,* held this year in the gardens of the home of our President, Clarence M. Cornish'24. On this occasion which, parenthetically, was an evening with a full moon, many of our members and their ladies wore costumes typical of various regions of the country; and the food — *tacos, carnitas, enchiladas, pambazos, frijoles, chicharron,* etc. — was served from conveniently arranged *puestos. Tortilleras* were busy making and cooking *tortillas.* The climax of the evening came when the *piñata* made in the form of an enormous cardinal beaver surmounting a papier-maché burro, was finally broken by one of the visitors, John G. Burke'38, and everyone rushed forward to pick up the souvenirs with which it was filled. On Saturday, following a reception generously tendered by the *Instituto Mexicano Norteamericano de Relaciones Culturales,* the final dinner took place at the Hotel Vasco de Quiroga with entertainment in the form of Mexican folklore dancing offered between the serving of the various courses.

Plans are already under way for our 10th Annual Fiesta to be held in March 1958, of which due notice as to finally selected dates and program will be given through The Review's issues of next autumn.

Alumni visitors from the United States this year were: Harry R. White'01, of Summit, N.J.; Myron M. Davis'08, of Boston, Mass.; Jonathan A. Noyes'12, of Dallas, Texas; Robert C. Stobert'12 and Fernand C. Weiss'13, of Birmingham, Ala.; H. E. Lobdell'17, of Cambridge, Mass.; Robert L. Moore'21, of Boston; C. George Dandrow'22, of New York; William H. MacCallum'24, of Los Angeles, Calif.; Louis J. Darmstadt'26, of Norwich, Conn.; William C. Sessions'26, of Cleveland, Ohio; Robert J. Joyce'28,of St. Louis, Mo.; Melvin Sack'28, of Louisville, Ky.; Frederic A. Celler'29, of Cortland, N.Y.; Prescott A. Smith'35, of Cambridge, Mass.; John G. Burke'38, Scott W. Walker'40, and Donal K. Holway'47, of Tulsa, Okla.

Alumni visitors from parts of México other than the *Distrito Federal* were: Eliot Camarena'44, Juan Celada Salmon'44, and Manual R. Llaguno Farías'46, from Monterrey, N.L.; and Joaquin Roche Diaz'54, from Mérida, Yucatán.

Members of our M.I.T. Club who participated in the Fiesta were: Club officers and members of the Fiesta Committee: Clarence M. Cornish'24, President; Alvino Manzanilla'31, Secretary; Augustín M. Valdés'25, Treasurer; Manual Sandoval Vallarta'21, Viviano Valdés'21, Thomas M. Nevin'24, Salvador Madero, Jr.,'29, José Felipe Pescador'45, and Peter R. Ehrenberg'52. As active members of the M.I.T. Club of México City: Manuel A. Hernandez'13, George D. Camp'16, Ricardo Granillo'21, Leonardo H. Tomacelli'28, Oscar Aros Villa'29, Leon Avalos Vez'29, Emilio N. MacKinney'30, Lyman Chandler'31, Hippolyte L. Gerard'35, Erwin Anisz'42, Enrique Curiel Benfield'43, Arturo M. Morales Dominguez'44, Egon A. Von Reutter'44, Hector M. Orozco'45, Pedro Albín, Jr.,'47, James J. Rattray'48, Charles W. Davis'49, Max Michel'53, Armando Santa Cruz Baca'54 Carlos Alonso de Florida'55, Marcos M. Suarez'55, Guido D. Guzman'55, Alfonso del Valle'57. — ALVINO MANZANILLA'31 *Secretary,* Horacio 1032, Polanco, México, D.F.

Miami Valley

The fourth meeting of the year was held March 25 at Benhams on Far Hills Avenue. About 20 members and guests were in attendance for a social hour, dinner, talk, and workshop on the subject of "brainstorming." Jack Moss, Dayton businessman, gave a short exposition on this technique, and the members then experimented with this new method of generating new ideas or developing new approaches. All present were enthusiastic and felt it was a worth-while meeting. Wallace T. Adams'21, one of the most faithful members of the Club, was dean at this meeting, which was presided over by Z. P. Abuza, President.

Plans are now in process for the last meeting of the year which will be a picnic with election of officers for the coming year. This is a co-educational affair and, since it will be held in May or June, better weather than last year is expected. — STEVEN HELLER'43, *Secretary,* 249 Claridge Drive, N., Dayton 9, Ohio.

Milwaukee

Mid-February was the time of a great deal of activity for the Milwaukee Club. After speaking at the Midwinter Convocation in Chicago, Professor Walter G. Whitman came to Milwaukee under the joint auspices of our Club and the First Unitarian Church. Professor Whitman spoke on "The Atom and International Relations" and was very well received. Two days later, on Tuesday, February 19, we were privileged to have professor Erwin Schell as our guest speaker for one of our most successful meetings to date. There is little doubt that the success of this affair was chiefly due to the presence of a large number of wives. Professor Schell spoke very entertainingly on a number of subjects. We were then fortunate in having the opportunity to see the "SAGE" film, and it's safe to say that everyone present was much impressed.

Because of this meeting's grand turnout, it has been decided to make a coed affair of our next and annual meeting, April 24. Professor A. M. Gaudin will speak to us on that occasion. Election of officers for the coming year is also on the agenda for this meeting. The Milwaukee area is losing a good active young member this month when Pete Stark moves his family to Berkeley, Calif. Pete will work for his master's degree at the University of California. Our loss is California's gain. We wish you all good luck, Pete. — WILLIAM H. SCHIELD, JR.,'46, *Secretary,* 2723 E. Newton Avenue, Milwaukee 11, Wis.

Monterrey Mexico

On March 26 the Monterrey M.I.T. Club received the visit of Dr. and Mrs. Den Hartog, who came accompanied by Conchita Lobdell. We missed Mr. Lobdell who had to fly directly from México City to Boston on business for his company, but Conchita was an excellent ambassadress for our vice-president. In the morning of that day, Dr. Den Hartog made an official visit to the Instituto Tecnológico de Monterrey, and was made welcome by the President and the Directors of the Schools of this institution, as well as by the Head of the Department of Mechanical Engineering, Ing. José María López Barañano.

Dr. Den Hartog kindly gave an informal talk to a group of professors and students in the last year of the course of mechanical engineering on the problems that actually are a challenge to those dedicated to the study of vibrations. The equipment for consecutive translation was used, and so Dr. Den Hartog could deliver his talk in English. At noon the same day, the Cía. Fundidora de Fierro y Acero de Monterrey (steel mills) offered a buffet lunch to Dr. Den Hartog. To this lunch several industrial men as well as members of the Monterrey M.I.T. Club and officials of the Institute Tecnológico de Monterrey were invited. Mrs. Den Hartog was taken care of by Mrs. Juan Celeda-Salmón and Mrs. Ross H. Compton who showed her around the city.

Dr. and Mrs. Den Hartog were honored with a country dinner by the Monterrey M.I.T. Club. This took place in the beautiful country home of Rodolfo González Garza'34. A guest of honor was the American Consul General in Monterrey, Mr. Frederick F. Oeschner. Among the attendants we noted: Oscar M. Ancira'51, Juan Celada S.'44, Eduardo D. Belden'17, Yu Kun Pei'43, Eliot Camarena'44, Eugenio Garza Sada'14, Penn L. Carroll'17, Julio de la Fuente'33, Pedro Sánchez Mejorada'55, Roberto Garza Sada'18, R. E. Valentine'23, Lauro Martínez Carranza'20, Oscar Sánchez Dávila'54, Manuel R. Llaguno'46, Ross H. Compton'47, José V. Ferrara'54. — ELIOT CAMARENA'44, *Secretary*, Apartado 360, Monterrey, N.L., México.

New Mexico

The annual meeting of the Club was held at the Coronado Club, Sandia Base, Albuquerque, on April 11. The following new officers were elected: President, Frederic C. Alexander, Jr.,'32; Vice-president, Frederick L. Mulberry, Jr.,'39; Secretary and Treasurer, Walter E. Brown, Jr.,'53; Member of Executive Committee, Bennett L. Basore'52.

Plans were discussed for the dinner meeting to be held at the Cloudcroft Lodge, Cloudcroft, N.M., on May 4. Please note address and phone number of new Secretary as 201 Wyoming Boulevard, S.E., Albuquerque, phone 5-1929. Give us a ring if you are in town and can join us in our monthly luncheons at the Coronado Club, second Thursday of every month at noon. — FREDERIC C. ALEXANDER, JR.,'32, *Secretary*, 339 Washington Street, N.E., Albuquerque, N.M.

New York

Plans for our Annual Beach Party are progressing with Fred Dunmire acting as chairman of this activity. All who have attended in the past will most certainly want to be there again, and you who have not experienced a day at Gilgo Beach have a treat in store. Gilgo Beach is a private beach club adjacent to the world-famous Jones Beach on Long Island's ocean front. Facilities include bath houses, club house, barbecue pits, athletic facilities, and beach with life guards. Gilgo Beach attendants will set up umbrellas and chairs for us as part of the facilities at our disposal. Plan to attend. For further details contact your Club Secretary, Harvey Kram'42, at Evergreen 9-4500 or Roslyn 3-4068.

The annual meeting of the M.I.T. Club of New York was held in the Club quarters on May 7. After election of officers, cocktails and a buffet supper were served.

As a result of Mr. Fred Parson's move to Bermuda, the Club has a new executive manager, Mr. Soren Mathiasen. Mr. Mathiasen is at the Club every day and can be contacted at Plaza 5-3094 for reservations and other special assistance. He enjoys helping both visiting and local Alumni. Since the Club quarters will be open all summer, why not contact Mr. Mathiasen and arrange to dine in our air-conditioned dining room when you are in the New York area?

The M.I.T. Club of New York has created a Club Utilization Committee which is chaired by Edward C. Edgar'35. The primary purpose of this committee is to encourage utilization of the Club's facilities for such functions as small technical dinners and games, including bridge, based upon class and/or industry participation. This committee has also set up a regular schedule of luncheon meetings for each Alumni class, one day a month. In order to help you plan to meet your former classmates, we are presenting the following schedule. The classes meeting during the first week of each month are — 1900-1909 and 1950-1951 on Monday, 1910-'11-'12 and 1952-1953 on Tuesday, 1913-'14-'15 and 1954-1955 on Wednesday, 1916-1917 and 1956-1957 on Thursday, 1918-1919 and 1958-1959 on Friday. The second week's schedule is 1920-21 on Monday, 1922-1923 on Tuesday, 1924-1925 on Wednesday, 1926-1927 on Thursday, 1928-1929 on Friday. The schedule for the third week is 1930-1931 on Monday, 1932-1933 on Tuesday, 1934-1935 on Wednesday, 1936-1937 on Thursday, and 1938-1939 on Friday. During the fourth week of each month the schedule will be 1940-1941 on Monday, 1942-1943 on Tuesday, 1944-1945 on Wednesday, 1946-1947 on Thursday, and 1948-1949 on Friday. We hope that you will afford yourself the opportunity of attending a pleasant luncheon meeting each month. Reservations can be made by calling the M.I.T. Club of New York, Plaza 5-3094. — HARVEY KRAM'42, *Secretary*, 101 Barnyard Lane, Roslyn Heights, L.I., N.Y.

Philadelphia

By the time these notes have gone to press, we will have held one of the most popular meetings of the M.I.T. Club of Philadelphia. For our 60th Anniversary Meeting on April 27, we have been given the privilege of enjoying the magnificent facilities of Longwood Gardens on the estate of the late Pierre S. du Pont, Class of 1890. The gardens and conservatory will be opened at 6:45 P.M. with a social hour in the music room until 8:00 P.M. when dinner will be served in the ballroom and conservatory.

Following dinner, we will be addressed by Dr. Killian'26, President of M.I.T., on activities at Tech, and we will get a preview of plans important to M.I.T.'s future contributions to science and education. Our second speaker will be David A. Shepard'26, Director of the Standard Oil Company (N.J.), who will tell about the vital role that petroleum currently plays in maintaining strength and peace of the free nations of the world.

Other honored guests are expected to be Irénée du Pont'97, Honorable Chairman of the Board for E. I. du Pont de Nemours, Dr. Greville Haslam'15, Headmaster of Episcopal Academy, and Mr. Theodore T. Miller'22, President of the Polymer Chemicals Division of W. R. Grace and Company. The weather permitting, we will enjoy the brilliant display of the illuminated fountains later in the evening. — HERBERT R. MOODY'41, *Secretary*, 8609 Patton Road, Wyndmoor, Philadelphia 18, Pa.

Puerto Rico

About 60 people — members of the M.I.T. Club of Puerto Rico, their families and friends — had a delightful picnic outing on Sunday, April 7, 1957, at the country residence of Don Luis R. González'12, local industrialist, among the lovely hills of Jagueyes and along the picturesque but tortuous road to Aguas Buenas.

The weather cooperated admirably; there was plenty of sunshine and crispness in the air. There was swimming in a pool which was fed from a spring, bowling in a couple of alleys, dominoes, and just plain loafing and watching of scenery for those who were not actively inclined. And, of course, there was hi-fi music and the retelling of tall tales and old jokes. The children enjoyed themselves, too, in a manually operated merry-go-round. The menu was definitely Puerto Rican. It consisted of an entire *lechon asado* (roast pig —no beaver was available), banana-wrapped *pasteles, arroz con gandules*, and guava jam with white country cheese. And there were drinks, naturally; whiskey and rum for those who were allergic to clean, safe spring water. — A. C. KAYANAN'42, *Secretary*, P.O. Box 9447, Santurce 29, Puerto Rico.

Rochester

The Personal Solicitation Campaign for the Alumni Fund, under the able leadership of our President-Elect, Fred Kolb'38, ended up with a 69 percent participation. This was an increase of about 20 percent

over the previous year in which solicitation was on a telephone basis. The advantages of a personal solicitation are obvious.

The culmination of the efforts of our educational counselors took place with the scholarship interviews held April 9. On that date our Scholarship Committee, headed by Dwight VandeVate'22, together with Sam Jones from the Student Aid Office at Cambridge, interviewed 19 scholarship applicants from our area. Seventeen of these applicants had been interviewed by a member of the Educational Council. The personal reports from these members are of great help to the Scholarship Committee in arriving at final decisions on awards. Of the 19 applicants, one received an award from the M.I.T. Club of Rochester Scholarship Fund, one received the Alumni Regional Award, three others were considered for Freshman Competitive Awards, and three received Honorable Mention.

We are very proud that further honors have come to one of our Club members, Clarence Wynd'27, who has been nominated to be a term member of the M.I.T. Corporation for five years; 1957-1962. — James K. Littwitz'42, *Secretary*, 191 Rogers Parkway, Rochester 17, N.Y.

São Paulo

The M.I.T. Club of São Paulo held its general meeting (14th) at the São Paulo Athletic Club on April 24, 1956. The main item of business was the election of the new governing body. Allen Velho'39 was elected to the presidency of the Club for the next two years, while Heinz Guenther '52 was elected to replace Allen in the office of vice-president. Marc L. Aelion'51 was drafted for another two-year term as secretary-treasurer. Present at the meeting were Adolfo Santos, Jr.,'24, Jorge Johnston'32, Gunnar Orberg'42, Hanns Maier '44, Oswaldo Torres'45, Victor de Mello '46, F. A. Ryan'47, Rogerio Rego'47, Marc Aelion'51, and Heinz Guenther'52.

The next dinner meeting was held on Wednesday, July 25, 1956, at the Cercel Suisse, Rua Caio Prado, No. 183. There was a general discussion of the Club activities for the current year. About a Club roster: we feel it would serve a useful purpose. For a proper compilation, though, we need your cooperation. Please send complete information as to company affiliation, position, business address and telephone, home address and telephone.

The 16th meeting, on October 12, 1956, turned out to be no more than an officers' meeting with just four of us attending; Allen Velho'39 Eduardo Prado'50, Marc Aelion'51, and Heinz Guenther'52. But the surroundings (Fasano Roof) were very pleasant, and too bad for all of you who did not attend. Such poor attendance prompted the calling of the seventeenth meeting on March 12, 1957, a most important one for our Club. Main item of discussion was the future course to be steered by the Club. We wanted to decide just what it is that we all want to do together. Besides deciding general policy, we also wanted to settle details for our general meeting to be held late in April. We also wanted to have nominations made for the post of vice-president, then held by Heinz Guenther'52, and for secretary-treasurer. See you there, *sem falta.*

The M.I.T. Club held its 17th meeting on March 12, 1957, at the Scandinavian Club of São Paulo, with the following members attending: Werner Bachli'33, Allen Velho'39, F. A. Ryan'47, Eduardo Prado'50, J. Loftus'50, Gunnar Orberg'42, Hanns Maier'44 Victor de Mello'46, and Marc Aelion'51. After an excellent dinner, the main item of business tackled was the nomination for vice-president to serve for the next two years. George Johnston has accepted his being nominated as a candidate. Further nominations will be accepted before and at the next meeting (the General Meeting) when the election will take place.

Through the courtesy of Petrobras, its superintendent, Dr. Antonio Rosa, and Jordan Loftus, we have been invited to hold our General Meeting at Tremembé. While at Tremembé, we will be the guests of Petrobras for a *churrasco* and a visit of the pilot plant for the industrialization of shale. This next meeting promises to be a very pleasant one, and we would like to do all we can to promote its success. Here are the details: *Date:* Saturday, May 11, 1957 — one-day meeting. *Meeting place:* Pilot Plant Building of Petrobras on the Taubaté-Tremembé Road. *Program:* Pilot Plant visit, general meeting, elections, *churrasco*. *Guests:* Wives, girl friends, and children (seven years of age and over) cordially welcomed. See you there. — Marc L. Aelion'51, *Secretary-Treasurer*, Av. Nove de Julho, 1289, São Paulo, Brazil, South America.

Southern California

On Friday, March 29 of this year, the California Institute of Technology was host to the M.I.T. Club of Southern California. The local M.I.T. Alumni, friends, and relatives were very warmly greeted at the Athenaeum by a reception committee composed of Dr. Watson, Acting-President of California Institute of Technology, Dr. and Mrs. Gray, and a score of student waiters. Following dinner, Jim Cullison, Club President and Master of Ceremonies for the evening, introduced those seated at the head table. To K. C. Grant of the Class of 1902 went the distinction of being the oldest Alumnus present. President Cullison concluded his opening address by presenting, "Dr. Watson, Acting-President of Cal Tech, who will introduce the guest speaker, Dr. Gray, and then we'll take a break." Many of the group humorously interpreted this to mean a break would be in order while the speaker discussed his topic.

Before introducing Dr. Gray, Dean of the California Institute of Technology Department of Industrial Management, Dr. Watson enlightened many of the Alumni present about the close relationship existing between M.I.T. and Cal Tech. He briefly discussed how in recent years these institutions have been exchanging ideas and problems which are characteristic of schools of this type. Problems and solutions encountered in managing an institute of high technical study have been periodically reviewed by the presidents and other heads of both schools with goals of greater advancement in science and further contributions to our nation in mind.

It was surprising to learn that two of the three men instrumental in the establishment of Cal Tech were M.I.T. men. Of course by this time a solid bond between both institutions was strongly felt by all M.I.T. Alumni present, so, needless to say, all those present returned from the break to listen to Dr. Gray discuss (with the aid of slides controlled by projectionist Bob Welles) "What Do Employees Think About Their Employers?" Dr. Gray presented considerable data acquired from polls conducted in several industrial plants. The purpose of these polls was to inform management of its weak points so far as its employees were concerned. It was quite conclusive that while female office employees are generally quite satisfied with their management, general working conditions, salary, etc., the average engineer, especially when in a supervisory capacity, is completely disgusted with his company, his management, and all things associated with his job. Of course, the outspoken engineers in the audience had many comments to offer during the question and answer period. An impartial observer would probably have decided that despite the poor showing of the engineer as a happy employee the excuse (or rationalizations) presented by the group firmly re-established the prestige of the engineer in industry.

Alumni present were: Robert L. Alder'37, Louis D. Alpert'33, Dean E. Batchelder'28, W. F. Burrall'38, James S. Cullison'41 George M. Cunningham'27, Homer S. Davis'24, Oleg J. Devorn'34, John H. Driggs'21, Kenneth R. Fitch'29, Sanford E. Glick'41, P. E. Golsan, Jr.,'34, K. C. Grant'02, H. W. Geyer'26, David E. Long'51, Herbert J. Mann'06, Douglas Montgomery'24, Robert J. Moon'47, Joe Marshall'53, Oscar F. Noss, Jr.,'49, Dirk A. Plummer'52, Ted Porush'51, Frank E. Reeves'24, Les Reynolds'55 G, Charles M. Walker'49, Robert Welles'15, John R. Wittels'47, Frank A. Yett'40.

We are all looking forward to the future when we may enjoy more evenings as interesting and as entertaining as the invasion of Cal Tech by M.I.T. — Joseph W. Marshall'53, *Secretary*, 904 West Hyde Park Boulevard, Inglewood, Calif.

CLASS NOTES

1885

Richard Swan Lull died on April 22, 1957, in New Haven, Conn. He was a special student assigned to the Class of '85. His degrees include a B.S., M.S., and D.Sc., all from Rutgers University; from Columbia University, a Ph.D.; and an Honorary M.D. from Yale University.

His titles were Sterling Professor of Paleontology and Director of the Peabody Museum, Emeritus, Yale University, and (active titles) Honorary Curator of Vertebrate Paleontology, Peabody Museum; Associate Fellow, Jonathan Edwards College, Yale University; Editor of the *American Journal of Science*, New Haven, Conn. — Arthur K. Hunt, *Secretary*, Longwood Towers, Brookline 46, Mass.

1891

The following letter from George Alden Curtis, M.I.T. Class of 1904, was received on March 27, and enclosed were clippings and a wonderful display picture of the Pittsfield Rotary meeting and of our classmate surrounded with boys from Crippled Children's Home. Our classmate was, of course, Arthur W. Pierce, seated at the head of the table.

Here is the letter, followed by the news clipping from the Berkshire *Eagle*, Pittsfield, Mass.: "Dear Mr. Brown: Arthur W. Pierce, M.I.T.'91, is locally known as 'the old bicycle rider.' He rides about 10 miles each decent day and says, 'That bicycle has cost the General Electric Company thousands of dollars.' He will be 87 years old on May 1. I was pleased to be present as a member of our local Rotary Club. Thought you might like the enclosed, possibly for Class notes. Sincerely, George A. Curtis'04."

And here is the clipping: "Arthur W. Pierce, Scoutmaster, and the members of Boy Scout Troop 27 of Coolidge Hill School (formerly the Berkshire School for Crippled Children), were honored today by the local Rotary Club. Mr. Pierce and the boys were guests this noon at the Rotary luncheon at the Wendell-Sherwood Hotel. A plaque was presented to Mr. Pierce, on behalf of Rotary, by William D. Dyer, Boy Scout executive and a member of the club.

"Mr. Pierce, who will be 87 next month, still travels Berkshire County via bicycle. He was born in Turkey, is a graduate of M.I.T., and retired as a General Electric electrical engineer in 1932. He has been active in scouting since 1921 and Scoutmaster of Troop 27 since 1951. He received the Silver Beaver Award in 1946; a service pin in 1951; and was the sole camper to receive the coveted Order of the Arrow at the Camp Eagle dress retreat in 1954. He also was honored for his scout service by the Pittsfield Chamber of Commerce in 1954."

From a later letter from Mr. Curtis, I quote the following sentence: "Mr. Pierce is such a modest and effacing gentleman that you would never get such news from him." By persuasion, I *did* get the following in his own hand: "As to my athletic and sports addiction, I got off with a good start by spending my first summer (1870) in a tent pitched on top of the two-story stone, flat-roofed house in Erzurum, Turkey, where I was born. Have kept up the habit and have slept nights more than 60 months under canvas — often in the open. Have never owned or driven a car, so have had to depend on shanks' mare and bicycle for transportation. That and work with Boy Scouts have helped keep me going, at a moderate pace, since I was retired from the Transformer Engineering Department in Pittsfield in 1932. Yours truly, Arthur W. Pierce."

The annual banquet of our Class will be held at the Country Club in Brookline, at one o'clock on Saturday, June 8. For many years we have held our annual banquet and meeting in this place. It is one of the best in the country, and I am told it is the first to be established in the United States — WILLIAM CHANNING BROWN, *Secretary*, Littleton, Mass.

1892

The Secretary has very little news from our classmates at the present time. He has just received notice of the death of Edward Hafer, at his home, 47 Hadden Hall, in Cincinnati, Ohio, on September 5, 1956. He was with us for awhile in Course I, but the Secretary has no record of his career.

I suppose that Sumner Ely is still active, blowing the smoke out of Pittsburgh, and that Channing Wells is enjoying himself out at Palm Springs. I hope to be able to meet a few of our classmates at the luncheon on the coming Alumni Day, June 10, 1957, and I hope that all of our classmates have done what they could in contributing to the Alumni Fund for the current year. — CHARLES E. FULLER, *Secretary*, P. O. Box 144, Wellesley 81, Mass.

1895

Since your secretary has received no information from our '95 mates during the past month, he wants you to know he constantly has in mind your welfare, and hopes all are comfortable and happy. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

1896

It was a pleasure to receive the following letter from Harold S. Boardman in response to our postal. He writes us from 39 Winter Street, Waterville, Maine. "Replying to your request, I am pleased to give you some of the data regarding my activities since leaving the presidency of the University of Maine. In 1937 I was asked by the Governor of Maine to assume the chairmanship of the State Liquor Commission for the purpose of 'cleaning house' and doing a job of administration. After leaving the Commission five years later, having done the job as far as the laws of the state would allow, I went into 'active retirement,' if there is any such thing! I still lived in Orono, the university town, and became quite active in town affairs. For years I was chairman of the Town Budget Committee and moderator of the town meeting.

"For over 25 years I have been interested in the Jackson Memorial Laboratory, located at Bar Harbor, Maine, and have for some time been a trustee of the same. The laboratory specializes in investigation of various diseases — chiefly cancer. It is a going-concern and is known all over the scientific world. Its budget is over $1,000,000 yearly, about half of which comes from grants and aid from various foundations.

"One of my hobbies is woodworking and finishing furniture. My favorite woods are white pine, yellow birch, and mahogany. I have a well-equipped shop, with power tools and machines. Gardening, fishing, hunting, and camping have been, in former years, my most loved vacation activities. Although I am in excellent health, my age now prevents these activities. July 1953 found my wife and me living in Waterville, which is a city located on the Kennebec River, some 70 miles from Orono. We moved here to be near my son and his family. The old home in Orono which had seen the best years of our lives grew larger and larger, and we 'rattled' around in it until we felt that a smaller and more compact home was necessary. We are very pleasantly located here and are very happy. During my active life I traveled all over the United States, but never got to foreign countries. Those days are past. I get to New York a couple of times a year and that is about the extent of my travels at present.

"I have been a Rotarian since 1921, and, on coming to Waterville, I was made an honorary member of this club. This gives me opportunity to meet many of the fine men of the city. Also Colby College is located here.

"My wife and I spend our summers at our cottage located at Hancock Point on Frenchman's Bay opposite Bar Harbor. It is a summer colony of about 75 cottages with plenty of land between the homes. I am a 'silver gray' of the region, having spent my first summer there with my parents in 1880. I cannot claim a continuous summer residence for all the years between, but for the past 22 my wife and I have spent four months of each summer at the cottage. It should be noted that in spite of my 83 years I still pass the yearly examination required in this state for a driver's license, and drive my own car.

"I note the passing of our classmate, Nathan C. Grover. He and I roomed together during our attendance at Tech. He was a grand fellow and became very prominent in hydraulic engineering. It became my pleasant duty in 1930 to confer on him the honorary degree of Doctor of Engineering. I hope this rambling account will 'fill the bill.'"

We regret to announce the deaths of two of our classmates. James Lewis Howe died on December 20, 1955, at the age of 96, writes his daughter, Miss Gwendolen Howe, of 108 Myers Street, Lexington, Va. On April 4, 1957, Henry S. Baldwin, age 82 years, of 141 Elmwood Road, Swampscott, died at Lynn Hospital shortly after suffering a heart seizure at his home. He was a native of Middletown, Conn., but had made his home in Swampscott since 1910. He was credited with developing the demountable auto wheel; and in World War I, he was detailed by General Electric to design and develop the first gas-electric driven armored tank. He was a direct descendant of Benedict Arnold, and in 1954 presented a collection of Arnold relics and mementos to Fort Ticonderoga Museum, N.Y. He leaves a sister, Mrs. Caroline S. Westlake of Summit, N.J. A floral tribute was sent from the Class of '96 and a note of sympathy was written to Mrs. Westlake. — JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline 46, Mass. HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline 46, Mass.

1897

We regret to report the death of another classmate. The following appeared in the *Free Press* (a weekly paper), Mel-

rose, Mass., on February 28: "Funeral services for Arthur S. DeWolf, 98 Ashland Street, were held at the Robinson Chapel, February 21, with the Reverend John J. Foster, D.D., Minister of the Highlands Congregational Church, officiating. Burial was in Wyoming Cemetery. Mr. DeWolf was in his 84th year and was born in Deerfield. The family later moved to Charlestown where he graduated from high school, and he later received his degree from M.I.T. He had been a resident of this city for 60 years."

From the Alumni Association we learn of the following change of address: Amos E. Gillespie, 785 New London Road, Hamilton, Ohio.

Although it is unlikely, it is possible that Alumni Day and our 60th Reunion may be a thing of the past when these notes are read. If not, remember that our reunion is the day after Alumni Day — namely, Tuesday, June 11 — and will be at M.I.T. Endicott House, Dedham, Mass. Our plan is to forgather at twelve noon and have luncheon around one o'clock. Be sure and come, and notify in advance the undersigned. — JOHN P. ILSLEY, *Secretary Pro-tem,* 26 Columbine Road, Milton 87, Mass.

1899

Again death has taken a member of our Class. Herman H. Smith (born Schmidt), former chief engineer of the New York City Board of Estimate, died on Sunday, March 3, at his home in Winsted, Conn., after a long illness. Herman entered city service in 1903 as a surveyor in the Brooklyn Bureau of Highways, and later was chief engineer of the Bureau before becoming acting chief engineer of the Board of Estimate in 1928. He was named chief engineer in 1921 and retired in 1934. Herman had charge of assembling master plans for parkways, bridges, and tunnels, and directed the mapping of Staten Island.

Lewis Abbott retired from active work two years ago. He makes his home in Andover, Mass., where he has lived for a long time. However, he is still a member of the firm of Shepley, Bulfinch, Richardson and Abbott, architects. He and George Glover sometimes meet in the autumn at the Mountain View House, Whitefield, N.H. Fred Stearns, IV, retired several years ago after the death of his partner, George Shepard, but Fred is still well and active and says he will attend the 60th Reunion in '59 even if he has to be carried there on a stretcher. Fred's home is Auburndale, Mass.

George Perkins closed his office at 201 Devonshire Street, Boston, the first of the year. He has been in business with his son under the name of George H. Perkins Company, Consulting Engineers. George lives in Salem, Mass. His son, John, is now with the firm of Stone and Webster, Boston. — BURT R. RICKARDS, *Secretary,* 173 Edgewood Avenue, Pleasantville, N.Y. MILES S. RICHMOND, *Assistant Secretary,* Little Compton, R.I.

1901

I continue with the replies to the Class Letter. Richard Dow, V, of Hamburg, N.Y., writes as follows: "It often occurs to me that each one of the Class might do something to stimulate interest and keep Class spirit alive at least during the few years that remain to each one of us. Possibly something of this sort could be discussed when we have our next reunion. It is an old subject but always one worth while. Mrs. Dow and I live in the country outside of Buffalo and, in fact, practically outside the big wide world in general. We live very quietly, and it seems that anything we might do would be of little interest as news. Some time ago I advised you of my thought regarding our next reunion. It would be wonderful to meet some of our classmates again — before it is too late — even if it involved only a simple dinner around Boston, as you suggest, and before 1961. And last, but not least, my appreciation to you, Mrs. Peterson, and Ed Davis for your good works."

From George A. Hall, IX, of Portsmouth, N.H.: "My wife and I hope to be celebrating our Golden Wedding in June. Each of our six daughters and three sons is married. We have 22 grandchildren and two great-grandchildren." William Sturtevant, VI, of Providence, R.I., writes me the sorrowful news that his wife passed away last September.

A. L. Galusa, II, Verona, N.J., has been designing, engineering, and selling Galusha Gas Producers for over 50 years. He has been granted 48 patents on them and has sold them all over the world. He is 79 years old and is still working full time and overtime. Willard Dow writes that he had to stop playing squash for four weeks on account of his back but is now back in form again. Bob Derby had nothing to add regarding his doings, but he is strong for some kind of a meeting in 1959, and you should have received his letter by this time. Will you all be kind enough to send some sort of reply so we can decide what to do.

I have received 23 replies to the Class Letter as of April 1. This is about one half of the total number received last year. I am looking for the other 20. — THEODORE H. TAFT, *Secretary,* Box 124, Jaffrey, N.H. WILLARD W. DOW, *Assistant Secretary,* 78 Elm Street, Cohasset, Mass.

1902

Our ranks have been thinned by the recent death of two of our number. A clipping from the Malden *News* tells of the death on March 11 of Lawrence G. Coburn. He graduated in electrical engineering and was for some time engaged in that line with the General Electric Company at Schenectady. Later he was engaged in his father's building business in Malden, his home town. His hobby was compiling records of Malden men serving during the two World Wars. Coburn never married but leaves several nephews and nieces.

The death of Winthrop Merton Rice, Course XIII, was reported in the New York *Times* of March 27, and we are indebted to it for the following: "Winthrop Merton Rice, President of Gielow, Inc., naval architects and engineers at 114 Liberty Street, New York, died today in Stamford Hospital after a short illness. His age was 78. Prominent in marine design and shipbuilding since his early association with the late Henry J. Gielow, Mr. Rice had directed the design development of a group of large capacity 'floating steam-electric power plants.' Built under the supervision of the Gielow organization for the Army and various private industries, these facilities furnished emergency power during World War II to American Army forces in Antwerp, Belgium, and other damaged ports. They were used also to provide aid to the inhabitants of these cities. In World War I Mr. Rice was attached to the War Shipping Board in charge of North Atlantic troop and supply ship movements to Europe.

"During the period of economic expansion in the Nineteen Twenties, the concern concentrated on the design of sail and power yachts. Among the outstanding achievements in this classification were J. P. Morgan's *Corsair,* Richard E. Cadwalader's *Savarona,* Caril Tucker's *Migrant,* Charles Roebling's *Black Douglas,* Hiram E. Manville's *Hi-Esmaro,* Julius Fleischman's *Camargo,* and others.

"Mr. Rice was born in Grafton, Mass., and received his engineering degree at M.I.T. in 1902. He was a member of the American Society of Naval Architects-Engineers, the American Society of Naval Engineers, the New York State Professional Engineers, and the Marine Historical Society. Surviving are his widow, the former Miss Helen Swift Jones, and two brothers, Philip B. of Blue Ridge, Summit, Pa., and Rowland G. Rice, of Bangor, Maine."

In the original clipping the name of Mrs. Rice was not complete and the addresses of the brothers not correct, and these items have been supplied as given by Mrs. Rice. Philip B. Rice is of the Class of 1903, Course VI, and Rowland G. Rice of the Class of 1904, Course XIII. We also learn that our classmate, Merton Rice, had studied law at New York University and passed the bar examination. He had served on the Board of Directors of Rockwood and Company, well-known wholesale chocolate and cocoa manufacturers, and at the time of his death was on the Board of the Barrett Company, makers of fine leathers.

Frederick Mathesius writes that he will be unable to attend the Reunion as he suffered a bad accident last year. In a letter to Dan Patch he explains that he fell from the top of a seven-foot ladder when it broke and he landed on his head on the concrete garage pavement. The fall resulted in a cracked skull and concussion, loss of hearing, and a fractured spinal vertebra. Mathesius is now at Palm Beach, Fla., where he has purchased a house, but he also has a Stamford address, 40 Hundley Court, a small apartment where, as he expresses it, he can hang his hat when he comes north in the summer to visit his children and grandchildren. — BURTON G. PHILBRICK, *Secretary,* 18 Ocean Avenue, Salem, Mass.

1903

Your secretary was privileged to look in on our Class Agent recently at his cozy

Cape Cod cottage in Egypt, Mass. Carlton and Mrs. Green are enjoying the return of spring flowers and birds and have been quite content at home during the rugged New England winter. Having traveled widely, going from one construction project to another during his active career, even the lure of Florida sunshine did not offset the task of migrating again this year. Herbert C. Merrill is now living at 12 Benton Street, Stoneham, Mass.

Supplementing information about Ralph H. Howes, recently deceased, it appears that he was born in Keene, N.H., the son of Captain Benjamin T. and Maria A. Howes. He graduated from the Keene High School in 1899, and besides his wife, Grace, and son, Ralph, Jr., of New York, leaves a sister, Mrs. Josephine Stiles of Keene, N.H. The Keene, N.H., Post Office was one of the important buildings erected by his firm.

We have a late receipt of the death notice of David S. Reynolds, 34 Alderwood Road, Newton Center 5, Mass. Further information will be in a later issue.

In casting about for reasons why we receive so little news from our classmates, one of our number has suggested that many similar organizations are composed of three groups: the first, relatively few in number, are always ready to help in class activities or send in news of interest; the second, a larger group, feel that their achievements are not outstanding and do not wish to boast unduly, so take little part in any activity; while the third group, a few who have achieved high honors, rather disdain consorting with those of less attainments. Of course, none of us wishes to be classified in either of the latter groups, so the best way to disprove the suspicion is to send in some personal news or other item of Class interest at least once a year. How about it? — LeRoy B. Gould, *Secretary*, 36 Oxford Road, Newton Centre 59, Mass. F. A. Eustis, *Treasurer*, 131 State Street, Boston 9, Mass.

1904

Another batch of material has been passed along to us by Mrs. Stevens. Henry would do a more interesting job in digesting it for you, but we will do our best. First, there were several newspaper clippings regarding "Shorty" Holbrook. They give details of his career which we will not attempt to repeat, but they all add up to the fact that in him we had a very distinguished classmate who made his mark in the educational and engineering professions.

By a strange coincidence we are able to report honors in the same fields recently received by another classmate and former associate of Shorty Holbrook's, Arthur C. Willard, President Emeritus of the University of Illinois. In a letter to Henry Stevens, "A. C." compliments him on the notes in the March Review and encloses some items about himself which would have delighted Henry as much as they did us. It is contributions like this which make these notes interesting. One of the items received from "A. C." was a copy of a letter to him from the secretary of the American Society of Heating and Air-Conditioning Engineers which reads as follows: "On behalf of the officers and the Council of the American Society of Heating and Air-Conditioning Engineers I am extremely happy to inform you of the action of the Council at its October meeting which confirmed your election as an honorary member of the Society. Because of your outstanding and distinguished services, which you have contributed not only to the Society but to your fellow engineers and the general public, this honor is conferred. As an engineer, educator, researcher and author, your contributions to the advancement of heating, ventilating, and air conditioning have been recognized and acclaimed internationally. It would give the officers and members of the Council the greatest pleasure to have you present at the banquet of the 63d Annual Meeting of the Society in the Conrad Hilton Hotel, Wednesday, February 27, 1957, to receive your Honorary Membership Certificate." Willard was president of this society in 1928, and, as associates on the honorary members' list, he will have such men as Milton Eisenhower, Arne C. Fieldner, Herbert C. Hoover, and Charles F. Kettering. On February 25 at the Conrad Hilton Hotel in Chicago a group gathered to give "commemorative recognition" to Arthur Cutts Willard and four of his "honored associates." It is impossible to adequately abstract the citation which was printed in the program so here you have it in full.

"Arthur Cutts Willard is a president emeritus of the University of Illinois. In 1904 he graduated from M.I.T., in 1907 married Sarah Lamborn. Successively from 1913 assistant and full professor of heating and ventilating at the University, head of the Department of Mechanical Engineering and then acting dean of the College of Engineering, he was elevated to the presidency in 1934. He has contributed brilliantly to science and engineering in heating, and air conditioning. Holland Tunnel ventilation consultant, leader of research teams which developed guiding principles for today's domestic furnaces and air conditioning, collaborator with medical scientists in pioneering investigation of atmospheric environmental influences on mankind, he is a past president of ASHAE and winner of that society's F. Paul Anderson gold medal award. His educational administrative accomplishments have been recognized in the conferring of degrees of Doctor of Laws or Doctor of Engineering by five major universities. Yet his possibly greatest achievement has gone relatively unnoticed. Selflessly modest, and intent on the moving pageant in which he was always an eager participant, he was himself unaware of the degree of influence he exerted on students and associates. His example of engineering and executive precision — but with human tolerance — and of unhesitatingly high professional and personal standards, has communicated itself by an indefinable alchemy to hundreds of men now scattered to the four corners — teachers, scientists and engineers, manufacturers, administrators. They are his invisible legacy."

Robert B. Sosman, Course VIII-3 (Electrochemistry), will receive the Purdy Award at the annual meeting of the American Ceramic Society at Dallas, Texas, in May. This award is presented annually to a member of the Society who has presented for publication during the preceding year a paper considered of importance to the science and technology of ceramics. In this instance the award was given for a paper presented before the British Ceramic Society on the occasion of his receiving an honorary membership in that Society in 1955.

It is pleasant to read such things about our classmates, and if we called the roll of those here and in the great beyond we would find that '04 men have done their parts in many fields toward the onward progress of civilization.

In a letter to Steve from George "Cap" Curtis we find he is still keeping in good physical condition at Pittsfield, Mass. One of his friends, A. W. Pierce, M.I.T. '91 (age 87), has just been honored for his work with Boy Scouts, so Cap has something to shoot for. He is young yet. The letter contains an interesting item about a ski area near Pittsfield. It is doubtful if any of us, except possibly Cap, still indulge in this sport, but we quote as follows: "Pittsfield has made the news this past winter on account of having the only ski area in New England where the unreliable natural snow cover has been augmented, as required, by the man-made product. Water pumped from a nearby pond is forced through movable outlet nozzles by compressed air at about 90 pounds psi. With the thermometer below 32 degrees Fahrenheit, snow is produced. The distributing nozzles deposit about one inch of snow per hour. The operator states that 82 straight days of skiing were available. Some week ends when Vermont and New Hampshire skiing was poor, skiers journey south to Pittsfield, thus reversing the usual trek northward. The owners claim to have invested over $200,000 and have had a very successful first season. The tourist business hereabouts also has benefited greatly. I have often wished that more of our classmates would help you out by sending news, so I am trying to do my bit."

There isn't much more Class news to report, but here are a few brief items. Katherine Dexter McCormick is quite active in the Boston Back Bay Neighborhood Association which tries to improve general conditions in this district. She recently presented the association with a public address amplifier for use at its meetings. Gus Munster made a brief trip to Florida and reported seeing Calvin Sheafe who has become a Florida resident. The Currier Langs also made a late season visit to Florida, but no report has come of their meeting with other classmates. The undersigned have been sticking to the home base and enjoying the cooling breezes from the Charles River and points north. — Eugene H. Russell, Jr., 82 Devonshire Street, Boston Mass. Carle R. Hayward, M.I.T., Room 35-304, Cambridge, Mass.

1905

The delay of nearly two months between the writing of the Class notes and

their publication in The Review brings about some peculiar situations. A week after I had sent in copy for the May issue I received a very interesting prospectus and itinerary of a trip Len and Mrs. Cronkhite were about to make. Around the world in 70 days, with their return scheduled at about the exact date of the publication of the June issue. However, here are some of the highlights. Leaving Boston by air on March 30, they were to visit London, Paris, Rome, Karachi, Bombay, Agra, Delhi, Calcutta, Rangoon, Bassein, Bangkok, Manila, Hong Kong, Tokyo, Sydney, Wellington, Honolulu, and Los Angeles.

Len had recently merged his company, forming the Baird-Atomic, Inc., and his primary objective was the conference and exhibit on peaceful uses of atomic energy to be held in Tokyo, Japan, May 13-20 under the joint sponsorship of the Atomic Industrial Forum of the United States, of which Len is a director. Len had been invited to give three addresses in India on radiation instrumentation and one in Japan on the same subject at the Joint Conference in Tokyo of the two Atomic Industrial Forums of Japan and of the United States, which conference is concerned with the peaceful uses of atomic energy. As a director of the United States Forum, Mr. Cronkhite is to give, in Japanese, a speech of salutation at the joint banquet in Tokyo on May 13. The Japanese Prime Minister, the Ministers for Atomic Energy, Foreign Affairs, Industrial Trade and Industry, the American Ambassador Douglas MacArthur, and the presidents of the Japanese and American Forums will speak. His purpose will be to cement relations with Baird-Atomic representatives in Paris, Rome, Bombay, New Delhi, Calcutta, Sydney, and Tokyo, and to appoint representatives in other areas for certain additional lines. Mrs. Cronkhite will be concerned with meetings on behalf of the U. S. State Department's Board of Foreign Scholarships, of which Board she is vice-chairman, and with meeting former Radcliffe students where time and place permit during their travels.

Sid Caine, after 46 years in the Episcopal ministry, has been retired from regular service and has removed from Norristown to 514 Lounfall Road, Plymouth Meeting, Pa. Sid adds, "I am not sitting down and taking it easy as our church is short of men — 700 short — and I have been helping out at other churches." Roy Allen, apparently having completed his project at Blythe, Calif., is leaving there for his permanent home in Cambridge, N.Y. He writes, "On or about September 1 we plan to return to California. Have bought a house at 1714 North Murray Street, Banning. The air, the view, the garden, and the good water helped to sell it to us. We are at an elevation of about 2,500 feet, with a magnificent view of the San Jacinto range in front of us and the San Gorgonio range at our back — both of them about 11,000 feet high, and snow-covered half of the year. Banning is only 22 miles from Palm Springs, and 80 from Los Angeles, and out of the smog. We shall keep our Cambridge place for the present. Might not like California as a steady thing."

Frank Chesterman was in Boston recently to attend a meeting of the Visiting Committee of the Department of Electrical Engineering, M.I.T., but on account of the rush trip we did not get together. He and Mrs. Chesterman spent several weeks in Florida this winter.

John Meggison, VI, who was with us for three years, attended the Regional Conference of the M.I.T. Alumni at Tulsa, Okla. on February 2. His letter is so enthusiastic that I quote: "It is about time I wrote to you again. This time to tell you how much we enjoyed the Regional Conference of the M.I.T. Alumni at Tulsa, Okla., on February 2. They sent me an invitation and program, and as it was only about 130 miles away, and the only chance to attend one of the Alumni gatherings that I ever had, the family talked it over and we decided it would be good to go. So I was able to take in the whole conference.

"It was a privilege to be there. One of the M.I.T. Alumni, Scott Waller, Chemist, who is now with the Pan American Oil Company in Tulsa, showed me around and introduced me to Warren K. Lewis, Professor Emeritus in Chemical Engineering at M.I.T., now retired. Doc Lewis and I are about the same age, 75 years, within a few months of each other. Being the oldest ones there they lionized us, put us on TV, took our pictures, and had an article in the local Tulsa *World* about us. Incidentally, the Tulsa *World* gave very generous space to the whole Conference and its speakers. Doc Lewis was one of the lecturers and gave a very interesting discussion on 'The Future of Engineering as a Profession.' To him, as to most engineers, the future holds much promise and many opportunities, both of service and of influence. Responsibility also is part of the engineer's life, socially as part of the community in which he lives, as well as to the work he does.

"The other lectures were equally interesting and informative. It was a privilege to be there. There were teachers from the local schools, and many from Oklahoma City. I talked with several, two of them teachers in Oklahoma City, one in chemistry and the other in mathematics. There were ministers and priests there, and even some nuns. It was a really instructive and encouraging gathering. The governor of the state declared February 2 M.I.T. Day, and the authorities made President Killian a sage and chief of the Osage Indian Tribe. It was a long-to-be remembered gathering. The Banquet offered good occasion for fellowship and enjoyment.

"Most of you have made your mark in the world in engineering of various kinds, but my choice has been what you would call religious work, but really answering the high calling of the gospel age, to be trained for administrative offices in the Kingdom of God to be established on the earth. This will all seem chimerical to you and to most people, but it involves mastery of self, and training to bring all one's powers under the control of the Lord's will. This is a life-time work. It means much Bible study, and service to help others to understand and to serve of their own free will and choice. There is nothing to join, except the Lord, and that in a consecration vow to do the Lord's will to the best of our ability to understand it. There are no collections, nor appeals for money, but each serves as he or she is able, and the individual determines that for himself by the Lord's help. Enclosed is a small booklet which may help a little to understand. I have never regretted making this choice, but rather have been more than thankful for the opportunity. The Bible has become the most interesting of all books, containing the most beautiful expressions of thought in poetry and music. Also Bible study involves some study of mathematics, science, astronomy, history, languages, plant, animal and human life. The study of engineering, electricity, and the other studies at M.I.T. has been a very great help to me in training in clear thinking and reasoning.

"Well, that is probably all you care to read along that line just now. Our family enjoys living in Kansas even better than in California. We have had severe droughts for several years past, but this year the rains have been encouraging. The Ozark region is beautiful, very like New England in some respects."

Herb Bailey, V, attended a conference of School Administrators of California at Asilomar (on Monterey Bay) as a representative of the San Bernardino County School Board, showing that though retired he is still active in civic duties.

Andy Fisher still thinks we should have more humor in our notes. I had a dream last night. It was June 1980. I was the sole surviving member of the Class of 1905. There was still some money in the treasury. Should I use it for another trip abroad? No, that would not be honest. I mailed myself a notice of our 75th reunion at Hotel Belmont, West Harwich, Mass. (where we had our 50th), then ambled into Boston, had a sumptuous dinner at Durgin-Park, then enjoyed a burlesque show at the Old Howard, picked up a chorus girl — and woke up, darn it. (End of humor.) Anticipating the possibility of the above, I declare a Class assessment payable at once. (You have already received by mail an official notice of this.)

Through Ed Rowe, Secretary of '06, I learn that Attwood E. (Gene) Rippey, III, passed away on January 6. Gene graduated with '06 and, since he chose to be classified with '06 in the Alumni Association, we have heard nothing from him in recent years. His last address in the Alumni Register was N. Hollywood, Calif. The '06 notes in this issue give a bit more of his history.

You have already received my letter telling you of the opportunity to "reune" at the Wianno Club, Osterville, Cape Cod, Mass., on June 21, 22 and 23. Roy, Andrea, Ruth, and I are going. There's time right now for you to notify me that you will join us. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston, Mass. GILBERT S. TOWER, *Assistant Secretary*, 35 N. Main Street, Cohasset, Mass.

1906

In the May notes something was said about the southern sojourners probably being back home "enjoying our New England spring," but up to the time these notes go in (mid-April) the month hasn't

been very balmy. Other areas to the west and south have fared much worse than New England however. Just this morning the weather forecaster said there was nearly a foot of snow in parts of Virginia, and in Richmond the temperature dropped from 80 to 30! At least one of those northbound classmates ran into wintry weather on their way. In a recent letter Abe Sherman had this to say about a part of their trip: "We left Sarasota April first, got caught in the heavy snow in northern Pennsylvania with prospects of spending the night in the car when we ran up to a five-mile blockade of stalled cars in the mountains. But luckily I could turn around and go back some miles to a road junction where we took a valley road to Elmira (just over the New York line) for the night." Presumably they made it to Rochester without much difficulty the next day.

For the archives, Floid Fuller has sent to the secretary the photograph taken at the Class dinner at the American House on May 31, 1906. By a rough count there were around 180 present with 12 at the head table. Abe says he had this photo on display in the living room of the cottage during our reunion and many commented that they couldn't remember it. However, those who saw and examined it could easily recognize at least a third of the fellows in the nearer end of the picture. We are indebted to Mrs. Brown for sending it to Floid, having found it among Harry's nostalgia.

In the July Review, among those Jim reported as unable to attend the 50th was William Franklin Englis, XIII. I had written Bill back in April and, knowing that he was retired, had enclosed a list of his coursemates, hoping he might contact some of them. In his reply Bill said, "I regret my inability to be there – but have been sick since early last month with a heart trouble and cannot go far from home – must keep where the doctor can watch every move. I am sorry about this and send my regrets to all the boys." However, Bill didn't long survive, as Mrs. Englis has notified the Alumni Office of his death on March 23. He was born in Brooklyn, February 19, 1883, prepared at the Berkeley and Syms Schools, and was with us all four years, a member of Hammer and Tongs and the Naval Architectural Society, treasurer and then president of the Civic Club, on the Class relay team sophomore year, and on the Class Day Committee. After brief periods with a firm of marine engine builders and a coal business in Philadelphia, in 1909 he formed a partnership in a wholesale coal business in New York. During and following the first World War he was secretary and manager of a company mining and shipping bituminous coal, evidently continuing in the coal business until the late thirties when, semi-retired, he later was assistant engineer statistician for the County of Nassau at Mineola. In the 1955 Register he is listed as retired. He married Sybil A. Genthner in 1913 and (in 1916) had one boy. A letter of condolence has been sent to the widow and family.

Another loss only recently reported is that of Attwood Eugene Rippey, III, whose widow has notified the Alumni Office that he passed away on January 6, but we have no further details. It would seem that A. E. might have had his class affiliation changed to '05 as he was with our Class only senior year to obtain his degree. In all the *Techniques* ('04 through '07) he is included with '05, is in the '05 group photo on Rogers steps, with the only exception being listed with '06 in the Mining Engineering Society our senior year. His home address then was San Diego, but he is not included in our Senior Portfolio. However, he is listed with our Class in all the Alumni Registers, from which (plus the file card) the following career is compiled. For the first five years or so he was with the Butlers Copala Mines at Copala, Sinaloa, Mexico, but was back in Boston around 1913 as Rippey and Company. By 1916 he was in Los Angeles as the A. E. Rippey Company in "automobiles," which evidently continued until the early twenties when he turned to real estate in which he remained as developer and realtor until the early fifties at which time he retired. A letter of condolence has been sent to Mrs. Rippey.

For your Golden Directory here are three changes of address: Paul Lincoln to RR #1, Nelson, B.C., Canada; Henry S. Mears to 17015 S.W. Upper Boone Ferry Road, Tigard, Ore.; and Earl G. Christy, P.O. Box 315, Chico, Calif. By the time you read these notes Alumni Day will have come and gone, and perhaps some of you "specials" will have joined the "regulars" for the day's interesting doings. – EDWARD B. ROWE, *Secretary-Treasurer*, 11 Cushing Road, Wellesley Hills 82, Mass.

1907

Unfortunately, our notes for this issue of The Review relate chiefly to the deaths of classmates. William S. Lucey, a graduate in the course in mechanical engineering, died on February 28, 1957, at LeRoy Hospital in New York City, after a brief illness. From 1907 to 1917 Bill was associated as an engineer with Eastman Kodak Company. He then became chief engineer for Hammermill Paper Company at Erie, Pa., leaving in 1928 to become resident manager of the plant of Grays Harbor Pulp and Paper Company in Hoquiam, Wash., now Grays Harbor Division of Rayonier, Inc.When he retired in 1950 he was executive vice-president and a director of Rayonier, manufacturers and distributors of purified wood cellulose. He lived at 112 East 74th Street, New York City, and is survived by his wife, Marjorie, and by four brothers and two sisters.

Frederic Eugene Banfield, Jr., died suddenly on March 19, 1957, while visiting at the home of his step-daughter, Mrs. Arthur B. Ferguson at Durham, N.C. Gene was associated with our Class only during our freshman year, but has been an actively interested '07 man, especially during the last 20 years, largely due, without doubt, to the fact that he lived in Whitinsville after 1935 and was subject to the influence of Phil Walker and myself. He went to Brown University, Providence, R.I., in the fall of 1904 and received a bachelor of philosophy degree there in 1906 and a bachelor of science degree in 1908. In 1908 began his lifelong career in the textile machinery industry when he joined the old Saco and Pettee Machine Shops in Newton, Mass. In 1912 this concern became Saco-Lowell Shops, manufacturers of textile machinery, and he served there successively and successfully as assistant superintendent, superintendent, agent, and in 1932 became a vice-president. In 1935 he became associated with Whitin Machine Works, in Whitinsville, Mass., a competitor of Saco-Lowell, as works manager, which position he occupied until 1947. He was also a company vice-president and director, and after 1947 was vice-president in charge of engineering. He retired in 1954, and during the last year and a half he and his wife lived in a beautiful home in Holliston, Mass. He was a trustee of the Whitinsville Savings Bank, a member of the American Society of Mechanical Engineers, and of several social clubs. He was survived by his wife, his step-daughter, and a son, Richard, of West Hartford, Conn. Gene was a soft-spoken, amiable, scholarly gentleman, and was technically an expert on textile machinery design and manufacturing, a man extremely popular with his associates.

You men who took the course in mechanical engineering will no doubt remember Masanao Yendo, who came to Tech from Japan and was affiliated with our Class. He received his degree in June, 1908, and eventually became a professor in Yokohama Technical College, Yokohama, Japan. I received word from the M.I.T. Alumni Office last March that they had just learned of his death in 1942.

Jim Barker retired in March, 1957, as chairman of the Board of Allstate Insurance Company, the highly successful company wholly owned by Sears, Roebuck and Company. Jim had held this post for 14 years. He will continue as a director and chairman of the finance committee, and as a director of Sears, Roebuck.

When you are reading these notes, our 50-Year Reunion will be about to begin, or it will be going on, or it will be past history by a few days, all depending on the date when you receive the June Review. If you receive it prior to June 7, and haven't already registered for our reunion, and decide at this last moment that you would like to attend the reunion, come along anyway, and we'll find room for you. Oyster Harbors Club, Osterville, Mass., June 7-9, are the place and the time. – BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, *Assistant Secretary*, 18 Summit Street, Whitinsville, Mass.

1909

We have frequently reported Phil Chase's, VI, activities in connection with the American Standards Association and the U.S. National Committee of which he was vice-president. The following announcement appears in the A.S.A. *Newsletter* of March: "First time in history the Electrical Standards Board has elected a new chairman – Philip H. Chase succeeds the late Rufus Harte, who until his death late last year had been chairman of the Board and its predecessor committee since their organization." The Electrical Stand-

ards Board gives final approval to all electrical standards before they become official A.S.A. ones. At the present time your secretary, as chairman of the A.S.A. Committee C42, American Standard Definitions of Electrical Terms, is responsible for sending many groups of electrical definitions to Phil's Board for approval. Also in the February number of the *Magazine of Standards*, Phil is cited as "This Month's Standards Personality." His picture appears at the top of the page and the article states he "is widely known as the efficient and genial general chairman of the International Electrotechnical Commission's Fiftieth Anniversary at Philadelphia in September, 1954," which we have already reported in these notes. It also gives all the important positions which he has held, and states, "His good nature under stress and his unfailing kindness and courtesy won the friendship of all who met him." We did not know until now that, "As a hobby, Mr. Chase collects coins with special reference to Confederate currency," and he has published a book, *Confederate Treasury Notes*, known in numismatic circles as "authoritative."

With reference to the foregoing, the Russian government has invited the International Electrotechnical Commission to hold its meeting in Moscow July 1-12, and your secretary has been asked to go as a delegate. He is a technical advisor to the Commission on the committee "Vocabulary," and will also be a delegate to the technical committee "Cables." The meeting includes a trip to Leningrad and one to the hydroelectric development at Zaporozhie on the Dnieper River. He and Muriel plan to leave May 23 and visit Great Britain, the low countries, and Norway and Sweden before entering Russia. We are sorry to miss Alumni Day, but Henry Spencer, II, has agreed to do the reporting.

In the Boston *Herald* of March 20 a notice announced that Dr. Davis R. Dewey 2d (Brad's son, of course), had been elected president of Baird-Atomic, Inc., to succeed Dr. Walter S. Baird who moves from president to full-time chairman of the Board. Davis, obviously, is named for his grandfather, the well-beloved professor of "Polly Con" in our student days. We are particularly interested in this announcement since Davis once took one of our courses at Harvard, and Dr. Baird was formerly one of our colleagues on the electrical engineering staff at Harvard. Davis was vice-president in High-Voltage Engineering Corporation of Burlington, Mass.

We recently received the Membership Appraisal List of the American Academy of Arts and Sciences on which the names of applicants for membership are sent to the fellows for approval. One must have attained distinction in some field of the arts and sciences to be elected. We feel quite proud that 1909 is well represented both directly and indirectly, for on the list are the names of Mayo Hersey, II, Davis R. Dewey, 2d, and Barnaby Keeney, President of Brown University and son of Bob.

You all must have received Jim's, VIII, excellent letter of April 1 telling of the Winter Meeting, the status of our contributions to the Alumni Fund, and Sam Prescott's book, *When M.I.T. Was Boston Tech*. We hope that the letter will spur members of the Class to speed up our preparations for our 50th anniversary.

We have received clippings from two Greater Boston newspapers telling of the retirement of A. A. Bonzagni as deputy registrar of motor vehicles, Massachusetts, after nearly 43 years of active service. He had reached the retirement age of 70 years. He spent but a short time with our Class, but his name is carried as of our Class on the Alumni rolls. He received an A.B. at Harvard in 1909, and LL.B., Suffolk University, in 1924.

We were shocked and most sorry to learn from both Molly, XI, and Tom Desmond, I, who received a note from Joan, of the death of Horace Clark, I, on March 3 in the Henrietta Goodall Memorial Hospital in Sanford, Maine. Services were held in the North Parish Congregational Church, Sanford, Maine, and interment at the Exeter Cemetery, Exeter, N.H. Horace was born in Andover, Mass., on January 19, 1888, and prepared for the Institute at Philips Exeter Academy. At the Institute he played guard both years on the Class football team and was president of the Exeter Club. He had a long and distinguished professional career in waterworks and sewerage which took him to various parts of the United States and South America. In Chile he was also in charge of railroad construction. He came to Sanford, Maine, in 1931 as general superintendent and general manager of the Sanford Water District, a position he held until he became a consulting engineer. Space does not permit our listing all the works for which he was responsible. He was a deacon of the North Parish Congregational Church, director of the Sanford Trust Company, and a member of the New Hampshire Water Works Association, the Boston Society of Civil Engineers, and the Maine Association of Engineers. He is survived by his widow, Mrs. Florence Baker Clark; three daughters, Mrs. Vagn Flyger of Solomon, Md., Mrs. Howard W. Brown of Sanford, and Miss Joan Clark of New York. I know that all the Class will agree that there never was a nicer fellow than Horace.

We wrote to Mrs. Clark expressing the sympathy of the Class as well as our own, and she replied as follows: "Thank you for your good letter of March 28. Horace would have been deeply touched could he have read the many cards and letters that have come to me with so many wonderful remarks about him. He certainly was a grand person with whom to live, and I am thankful for the many happy years we had together. I am pleased to know that you are including a memorial notice in the June Technology Review and thank you for having a copy sent to me. One of the items that the obituary missed was the fact that Horace and I were married at Cristobal in the Canal Zone. Then I went back to South America with him. We lived at Chuquicamata, Chile. Horace had had a heart attack in June, 1955, but after a quiet summer seemed much better. Then last year he was engineer for major waterworks additions to the Gardiner, Maine, water supply. This included two standpipes, five miles of mains, a booster station, etc. He enjoyed this project, and we were settling down for a quiet winter when he picked up a virus. This seriously affected his heart and after seven weeks in the hospital, apparently gaining slowly, he died suddenly."

Kenneth P. Armstrong'10, President of the M.I.T. Club of South Florida, wrote us stating that Dr. Wilfred S. Hale, XI, died at Orlando, Fla., on March 1. Dr. Hale was 86 years old. Services were held in Albany, N.Y., on March 5. He was formerly dean of the Kingdom Bible Seminary at St. Petersburg, Fla., but retired a year ago because of ill health. He came to Miami 35 years ago and maintained continuous residence there, his last address being 500 N.W. 23rd Court where his widow still resides. He was graduated from Albany Medical College, Union University, in 1894 with an M.D. degree, and from Crozier Seminary (Baptist) in Chester, Pa., in 1911.

In the April Review we told of the death of William R. Reilly, III, at Barre, Vt. Mrs. Reilly has recently written us as follows: "Have been away since Bill's passing, and arrived home to find much mail, among them your kind letter. Bill always kept his interest in his Class through The Review each edition. Once in awhile we'd meet up with a classmate and gather more news. He was very much loved by everyone who ever came in contact with him. He was a very devout husband and father. He led a full, happy life and never complained. He had generalized arthereosclerosis and just before Christmas it hit his heart. The doctor allowed him to come home from the hospital so he could have his family with him. He was with us over a month and though bed-ridden was conscious and never had any opiates, so was conscious of going but well prepared and ready. It was so peaceful we have not felt sad but rather glad for him. He made all plans through the years for when he died, and left everything in good order, always thinking of us, never of himself. He was humble, charitable, and patient. We shall never feel him really gone but a thin veil between us. Thank you for your note of sympathy." — CHESTER L. DAWES, *Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries:* MAURICE R. SCHARFF, 250 East 43d Street, New York 17, N.Y. GEORGE E. WALLIS, Wenham, Mass.

1911

Hope many of you got the thrill Sara and I did on that evening in late March when the Annual Academy Awards television program was on from Hollywood and New York, when our own Dick Ranger, VIII, was the first individual mentioned for an award. That opening announcement came in as follows: "These awards were voted by the Academy Board of Governors, upon recommendation of the Scientific or Technical Awards Committee. Class I and II, nine. Class III, to Richard H. Ranger of Rangertone, Inc., for the development of a synchronous recording and reproducing system for quarter-inch magnetic tape. By this process quarter-inch magnetic tape without sprocket holes may be recorded and re-

produced in synchronism with the picture."

In answer to my congratulatory letter requesting his story, Dick wrote: "Went out to Hollywood some eight years ago without getting much enthusiasm, except from one rather small sound man there, Glen Glenn. He had the nerve to start using the equipment and now he is doing more than any other studio out there, including the big ones. He has some 14 of our sound recorders, three in trucks, some on stages, and the rest just on the ends of telephone lines to take down the sound as the cameras roll.

"The whole trick is that we have worked out a convenient and inexpensive way of keeping the tape at exactly controlled speed so that it will run always in synchronism with the picture, even though it has no sprocket holes. We put what we call magnetic sprocket holes on the tape, which hold it under control. But not only is it useful for the big studios; it has made it possible for schools, industrial studios, and church organizations to add lip synchronous sound to their films. Se we hope that it will grow in this field to the benefit of all concerned. It sure was a break that we were mentioned first; sorta bowled over all our friends!"

Bill Orchard, XI, sent me clips from the Newark *Evening News* and the subsequent Sunday edition, the former containing on page one a happy snap of Celeste Holm, actress presiding at the New York ceremonies, congratulating and heartily shaking hands with our smiling hero, while the Sunday had a "working shot" of Dick, featuring a story titled "'Oscar' Winner Works Hard." In the opening paragraph he is described as "a lively 68-year-old inventor and sound engineer who keeps in trim by shooting baskets with his employees in a small gymnasium he has fitted out on the top floor of his plant."

"Ranger is currently working to perfect a magnetic tape which will contain two sound tracks instead of one," the story says. This, according to Dick, is "the stereophonic system being used by movie theatres, making it like listening to music with two ears instead of one, and what we'd like to do is to get a system which could be used in homes."

Describing Rangertone's building, the story says, "Ranger, who had done work in radio facsimile, electronic organs and radar, does his work now in a modest three-story building with a full-time staff of eight men, augmented by a part-time crew that includes high school students studying electronics and two manual training teachers from Kearny. It has the look of a happy shop with recorded music filling the air, a stove for heating coffee, and an informal gameroom on the third floor, including a ping-pong table and a small basketball court with one basket, where Ranger and his staff relax after wrestling with electronic problems. Most of the working space on the third floor is now being used by independent producers who take cameras and tape recorders into the field to do half-hour films. 'They bring the material here and we put it together for them,' Ranger said, 'synchronizing all the elements of sound and film.' Ranger usually works six days a week and sometimes he's at his drawing board on Sunday."

We were also happy to learn that a signal honor was paid to "eagle-eye" Bill Orchard by the South Mountain Lodge, B'nai B'rith, when the South Mountain Americanism Award for 1957 was awarded to William John Orchard, "Mr. Maplewood." In listing his many contributions to the Maplewood-Orange area over the years, the chapter bulletin, announcing the award, added: "In May, 1953, he was honored by the citizens of Maplewood [as reported in 1911 notes thereafter] when a new playground being developed was named 'William J. Orchard Playground.'" And those are only a few of his contributions to his community. Anything he undertakes seems to attain successful fulfillment. "Mrs. Orchard, who was the former Marie Frances Singler, became the wife of this human(e) dynamo in 1913, and their union was blessed with 5 children and 14 grandchildren. He maintains a summer residence in Bay Head, N.J., where he indulges in his major hobbies of painting and sailing, as well as music." In addition, Bill has been elected treasurer of the American Water Works Association, to take office at the annual meeting of the association on May 12 in Atlantic City. We're proud of you, Bill!

President Don Stevens, II, writes: "I am giving lectures on ethics to three classes at Newark College of Engineering. I think this is about the tenth year and I still feel I don't know as much about ethics as I thought I did when I started."

Still maintaining his interest in municipal affairs in his native Marlboro, Mass., Johnnie Bigelow, IV, was recently confirmed as appointee for a five-year term as a member of the City Planning Board. Our thanks to Erv Young, I, for some fine color snaps he took at the "Welcome to Dennie" luncheon in New York last January – first attempt at color photography. He said he and Bess were leaving for Fort Lauderdale in late March for a visit with her sister and to do some sight-seeing. In the recent M.I.T. Alumni elections, Albert O. Wilson, Jr.,'38, one of our junior Eleveners, was re-elected Class representative on the Alumni Council for five years.

Joe Gershberg, VI, who retired some time ago from Brooklyn Edison but remained in New York in a consulting capacity, has finally retired to the West Coast and his address now is 2051 Pelham Avenue, Los Angeles 25, Calif. Ed Pugsley, VI, has returned from Florida, where he and his wife have a home, and will be at Leets Island, R.F.D. 3, Guilford, Conn., until fall. Charlie Hobson, X, writes that although he hasn't moved, his street name has been changed and now it's 2608 Virginia Avenue S.E., Charleston, W.Va.

These notes will appear practically coincidentally with the 1957 Alumni Day – Monday, June 10 – and we'll hope to see many of you at the Institute that day. Our Fund figures still climb, and please be generous with *your* contribution, for everything we give for the next few years is included in our 50-year gift in June, 1961. – ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Framingham, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Street, Medford 55, Mass.

1912

A note from Ralph Ferry, who has retired from the Aluminum Company to the Eastern Shore in Maryland, says that they are still working on specifications and drawings for their new home on a very attractive point of land about halfway between Eastern and Oxford. Whether to build now or wait a year will be the question after they have the specifications completed. They hope to be at the reunion in June.

A card from Bill Canaday reports that his garden has suffered badly through the loss of most of his roses. Hibiscus and Poinsettias were badly hit by the frost they had. Azaleas, pinks, carnations, and a few roses are in blossom now, and last week he planted Zinnias. His fruit trees are doing well and the lawn is in wonderful shape. I wish you all could see Bill's garden as it is very attractive. – FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. LESTER M. WHITE, *Assistant Secretary*, 1230 N.E. 102d Street, Miami 38, Fla.

1913

How the months pass. Your Scribe has neglected his usual Class notes for two issues – but mostly from the lack of news from all of you. We need something of interest from you in order that we may relay some sort of reports to all of our readers. Although I retired over a year ago, I am more active in my semi-retirement than I have been for years. Much of my time is taken up with politics, both locally and state-wide. Outside of "Ike," we Republicans have little to cheer for in Massachusetts. As town chairman of the Red Cross Fund Drive in Canton, I have spent a major portion of my free time during the past two months on that project. Our drive, by the way, was very successful. Also, in a temporary position, I have been serving as a United States deputy marshal in the Federal Courts at Boston. We expect shortly to pass papers on a new home which is located on a very quiet street here in Canton which will keep my wife and I busy repairing and renovating the 35-year-old house and will furnish a certain amount of farming for 20 years.

It is with a very heavy heart that I must report the death of Robert O. Rider, formerly of Auburndale, Mass. Bob was my closest friend at M.I.T. in our freshman year, but was forced to withdraw and entered the employ of the Williams Soap Company in Glastonbury, Conn. About 1916, he was married to Helen Williams and soon after was stricken with polio. Both Bob and his wife, two sons, and several grandchildren have been very active in the community life of Glastonbury, Conn. He was the purchasing manager for the Williams Company right up to the time of his death, December 18, 1956, after a very short illness.

Again, we are bearers of sad news. "Charles F. Haglin, 66, head of one of Minneapolis's largest building contracting companies, died today at La Jolla, Calif., while on a vacation. He suffered a stroke Friday. Mr. Haglin was chairman of the board of the C. F. Haglin and Sons Com-

pany, a firm founded in 1881 by his father. Among Minneapolis buildings constructed by the Haglin Company are the Northwestern Bank Building, Rand Tower, Nicollet Hotel, and the Minneapolis Star and Tribune Building. Born in Minneapolis, Mr. Haglin attended the University of Minnesota for three years before switching to M.I.T. where he received his engineering degree [Course II]. He had been chairman of the capitol long-range improvement committee's task force on schools. He also was a member of the Minneapolis Club, Woodhill Country Club, and Zuhrah Temple of the Shrine. Mr. Haglin, who lived at Maplewood, Lake Minnetonka, is survived by his wife; two daughters, Mrs. Calvin Ireys, Cottonwood, Ariz., and Mrs. Philip Little, III, Wayzata; and nine grandchildren. Memorial services were held at La Jolla, Thursday, March 7, 1957." Our heartfelt sympathy goes to Charles' dear family.

A short note has been received from G. E. Leavitt of Glen Gardner, N.J.: "Now that I am retired, I shall try to find time to fulfill my obligations to my Class somewhat better than I did in the past." Good work, George. Let us hear more from you.

Warren Glancy, Charles Thompson, and several of our other live classmates have called to our attention the article, "The Most Unforgettable Character I've Met," by Robert N. Buck in the February 1957 issue of *The Reader's Digest*, and that *character* is none other than our own classmate, Mrs. Marion Rice Hart. If you have not read this very well done article, you should. A year or so ago, we reported in our column in great detail the travels of our round-the-world lady flyer. We sincerely hope that you have recovered fully from your hospital experience, Marion, and that you will again take up your wanderlust and on to Africa.

The Midwinter Meeting of the M.I.T. Alumni Association on January 30, 1957, was as usual a success, but the '13ers were conspicuous by their absence; at least we only met Frank Achard and Bert Cushing for Frankie and I arrived rather late for the dinner after a long reunion with others at the Faculty Club. Jack Farwell sent us a copy of a letter he wrote to George Clark, whom we all hope to see at our 45th in 1958 at Oyster Harbors Club in June. It was nice to hear from you, Jack—write more the next time.

Again and again, we regret that we must inform you that the "Grim Reaper" has taken two more of our beloved classmates. We have very few particulars since we only received a mere statement from the Alumni Office announcing the deaths of Captain Morris M. Leonard, Course V, Baptist Corner Road, Ashfield, Mass., on June 13, 1956, and Albert P. Nelson, Course II, 125 Hobart Street, Braintree, Mass., on December 31, 1956. If any of you members can furnish further details, we shall be pleased to enlarge on our bare statements.

Well, another true and loyal pal of our greater Boston group has joined the "unemployed," and we quote the Boston *Globe* of February 5, 1957: *"Fire Engineer Retires:* A. L. Brown, Chief Engineer of the Factory Mutual Engineering Division and an authority on fire protection, announced his retirement from the firm this week. He will serve in an advisory capacity to the Factory Mutual and National Fire Protection Association." Welcome to our fold, Al. Now you and Emma can go square dancing every night.

Our regular informant, Larry Hart, has again assisted us in sending condolences to Mrs. Sherm Ramsdell and family, and we quote the *Herald* of Lubec, Maine, of January 11, 1957: "Sherman R. Ramsdell, formerly of 67 Robbins Street, Milton, Mass., died on January 9 in Mound Park Hospital, St. Petersburg, Fla. Mr. Ramsdell taught physics and chemistry at Milton High School for 30 years until his retirement 11 years ago. He came to St. Petersburg six years ago from Lubec. He was a son of the late Robert W. Ramsdell of West Lubec. A native of Chelsea, Mass., he was a graduate of Lubec High School, Bates College, Lewiston, and M.I.T. Survivors include his wife, Virginia F. Ramsdell; one son, Richard T. Ramsdell, Virginia City, Nev.; a daughter, Mrs. Constance Blair of Schenectady, N.Y.; and six grandchildren."

Well, Ellis Brewster and his family are certainly in the news nearly every day. You students of early Massachusetts history of course know that many of the descendants of the Pilgrim Colony at Plymouth, Mass., are establishing a Pilgrim Plantation on Eel River, Plymouth, where the present public bathing beach is, or was, located on the southerly side of Plymouth on Route 3. Henry Hornblower and Ellis (Bill) Brewster are the leaders of this historical project. Young Bill has already been to Plymouth, England, to confer with the Lord Mayor and make arrangements in connection with the building and the voyage of the *Mayflower II* to this country. The trip includes a visit of about two weeks at Plymouth, Mass., that is at the plantation, then to New York for a few weeks, and then back to its permanent "home" adjoining the Plymouth Plantation.

Thus, the start of another story. You who attended the 1913 reunion at Falmouth last June remember that Bill Brewster was elected to serve as the head of our 50th Reunion Special Gift Committee. Now, with the creation of the Plymouth Plantation, its construction, its management, and what follows, Bill has resigned as our Fund Chairman, and, after several telephone conversations between Ellis, Charles Thompson, your faithful servant, and old dependable Bill Mattson, it was agreed that Bill Mattson will carry the ball. Does that suit you other wealthy and not quite so wealthy members of 1913?

Yes, just once again, we must bow our heads in memory of another departed friend, and we quote from a very sad note from a very sad girl: "My husband, Silas H. Champlin, died January 22 of cancer. He had retired as head of research with the Heekin Can Company in July, 1956, and we were expecting to go back to California as soon as we sold our property here. We had lived in California and have a daughter, Carolyn, living in Berkeley, and were looking forward to life in that state with great hapiness. I shall still go, but alone this time. Champ had a great affection for M.I.T. and the education and training he received there." Silas was born and educated in the schools of East Longmeadow, Mass., and won scholarships at Tech. He majored in chemistry. He was a research chemist for Campbell Soup Company and several other companies in Canada, California, Onset, and Cincinnati. He is survived by his wife, Edna, and a daughter, Carolyn, of Berkeley, Calif. The funeral was held in Cincinnati. To you, Edna Champlin, we extend our most heartfelt sympathy.

But now the *big news:* Annie Louise Blackadar and Roland Charles Thompson announce their marriage, April, 1957, Marblehead, Mass. We, my wife and I, have met the lady, and, Charlie, you are to be congratulated. A long life and a happy one to you both.

If you boys and girls want news in every issue, just sit down with a pen, or a pencil, or that broken-down typewriter, and express your thoughts, your desires, your plans, yes, even your politics — we can take it and will use it or that. Changes or new addresses: Herbert B. Cady, RFD #2, Masons Island, Mystic, Conn.; Edward Hurst, Captains Hill Road, South Duxbury, Mass.; Ernest Weller, Baldwin Mill Road, Baldwin, Md.; William F. Herbert, 755 Bell Street, Edmonds, Wash.; Merrill J. Smith, 4701 Orange Knoll, La Canada, Calif.; Clarence J. Berry, Round Bay, Severna Park, Md.; Edward E. Jewett, 9 Doty Avenue, Danvers, Mass.; Maurice E. Levy, 315-86th Street, Miami Beach, Fla. We shall be looking for you Alumni Day at the Institute. — GEORGE PHILIP CAPEN, *Secretary and Treasurer*, 623 Chapman Street, Canton, Mass.

1914

In a recent issue of The Review your secretary told me of an interesting visit with Jim Holmes at Los Angeles. In the item your secretary commented on Jim's youthful appearance, with a reference that he looked a long way from retirement. A letter now explains the reason. Jim writes: "I squeeze out time for a really first-class, automatically controlled orchid house which I have at home in which I grow Anthurium the equal of any in Honolulu and orchids of pretty fair quality. Mrs. Holmes and I also have a five-hundred-acre ranch near Indio which we bought three years ago. One hundred thirty acres of this is fully developed, and since we bought it we have converted it into a citrus ranch. We now have a total of about 15,000 trees divided between ruby-red grapefruit, white grapefruit, Lisbon lemons, Eureka lemons, tangerines, and mandarins. In between the rows of young trees we grow Portuguese yams, which are the most delicious in the world. Some day I hope you will come through here when we can go down to the ranch and swap reminiscences. Because of the gardens around the houses, unusual shrubs, rock walks, swimming pool, etc., it is said to be one of the most beautiful ranches in Coachella Valley or around Palm Springs." This is on top of being the president of one of the largest engineering-construction firms on the Pacific Coast—or should I say in the country, because his offices extend from Washington, D.C., to Honolulu.

Another of our young retired class-

mates is O. C. Hall, who, on his retirement from the Bell Telephone Laboratories two years ago, went right to work for the United States Instrument Corporation at Charlottesville, Va. In a recent letter, O. C. wrote as follows: "My job is to adapt the design of step-by-step dial system equipment manufactured by Siemens Halske for use in the American telephone system. This requires considerable change in the circuits, since in Germany there is practically no party-line development and all lines are on a message-rate basis with toll calls charged on a message-unit basis. No provision is made for person-to-person service. We cut over our first office of 200 lines – 600 subscribers at Reedesville, W. Va. – on December 15. Our office supplements an existing dial office which uses code ringing on 10 party lines. The customers on our office are all delighted with the improved service. I made several trips to Reedsville. The natives say it doesn't rain every day in West Virginia, but I don't believe them. We will also cut over a 100 line, 300 subscriber office at Stanardsville, Va., to replace a present magneto office, and we have contracts to supply eight offices under four R.E.A. projects in Iowa, Georgia, Kentucky, and South Carolina. I am responsible for all circuit design, including power and ringing equipment. Never worked half as hard at the Lab."

O. C. also tells of the activities of his competent family, one of whom is Elizabeth, a member of the Westminster College Choir. This 45-member choir just completed a world-wide tour, starting with a month in the United States and followed by an air tour with concerts in Japan, Korea, Okinawa, Formosa, the Philippines, Hong Kong, Laos, Cambodia, Vietnam, Rangoon, Bangkok in Thailand, Singapore in Malaya, Ceylon, India, Pakistan, Iraq, Iran, the Near-East European area, and then across Europe.

Another Fourteener who has not let his retirement bother his activities is Alden Waitt – Major General, Retired – who bobs up suddenly at about any point on the globe. Although San Antonio, Texas, is his nominal home, the last item comes out of New York, where the American Chemical Society announces that he has been appointed to their advisory board of their News Service. In his spare retirement time Alden is vice-president and consultant of R. S. Aries, also of New York.

Your president and secretary feel very humble just plain retiring in view of what these other classmates are doing during their alleged retirement. Charlie has a beautiful farm in Maine, and he is looking forward to spending much of his time there, particularly this summer. Your secretary, like Charlie, is also retiring this June and likewise hopes to spend a few leisure hours this summer, but by cruising the Mediterranean. Our assistant secretary and Alumni fund agent, Herman Affel, will carry on in his usual efficient manner, as he does not retire as vice-president of the Bell Telephone Laboratories for another year. Note that Charlie and your secretary have new addresses. Your secretary will be in close contact with the Institute because the apartment house that is his new address is right on the M.I.T. campus. – C. P. Fiske, *President*, Cold Spring Farm, Star Route 3, Bath, Maine. H. B. Richmond, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass. H. A. Affel, *Assistant Secretary*, 120 Woodland Avenue, Summit, N. J.

1915

This is a sad column of notes to write – 1915 has suffered a hard blow. Our fine old friend and classmate, our Class treasurer, Henry Sheils, passed away on March 22. Henry had made a remarkable recovery from an operation around Thanksgiving time and seemed to be rallying very well. Some time after the first of the year he became painfully sick again and passed away in a short time. Anything we say here will fall immeasurably short of properly or possibly expressing our fond regards for Henry and our deep, sympathetic feelings for his family. But we can all remember Henry as a true, loyal, devoted friend and classmate.

He was the instigator, organizer, and "life" of every New York and Boston Class dinner and of each five-year reunion, where he always "held court" with his Course I and summer camp gang. Generous and willing to the point of being self-effacing, Henry was always ready and glad to help anyone at any time. Many of us can easily call to mind the many favors he did for us and our friends. He took great pride in his Class and M.I.T. affiliations, and as Class treasurer did an outstanding job in collecting dues to keep a sound treasury balance and worked closely with Max and Clive on their Alumni Fund programs. The flowers our Class sent were but a small expression of our sentiments for Henry.

It was a privilege for the large delegation from our Class, with their families, to attend Henry's wake in Watertown, Mass., his Requiem High Mass at St. Patrick's Church, and his interment in St. Joseph's Cemetery. Henry boasted rightfully and proudly of his fine family. He leaves his widow, Mrs. May Lynch Sheils, four married children, and 13 grandchildren.

Men of 1915, wherever you are, whatever you are doing, pause for a moment's silent tribute to Henry's memory. We'll all miss him, but we'll never forget him. – Azel W. Mack, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass.

1916

By the time this issue of The Review is in your hands, the 41st Reunion will (probably) be but a part of history. It will have been a reunion with several significant features . . . held during the week rather than over a weekend, and graced by the presence of members of the fair sex. For those who didn't go, we suggest that you inquire about it from someone who did and then feel good and sorry for missing something much worth while. It's a common decision of the attendants of each Reunion that they won't miss any of the future ones if they can help it.

Back in January, the Niagara Falls *Gazette* carried a full-page text-and-picture story of considerable interest to industrial researchers, under the caption "New Falls Research Firm Studies Manganese Ores." Prominent in the story was none other than our Ray Brown, who is vice-president and manager of Strategic-Udy Processes, Inc., known as SUPI. We asked Ray about it, and he explains: "For many years, I worked for Comstock and Westcott, Inc. We have been engaged in contract research and development, with headquarters at Cambridge, Mass., and a branch at Niagara Falls, N.Y. Last April (1956) Comstock and Wescott, Inc., sold the Niagara Falls branch of the business – sort of a spin-off – to Strategic Materials Corporation. Needless to say it was quite an emotional shock to see the name of another company above our entrance, particularly since I had enjoyed so many years of happy association with Dr. Daniel Comstock'04, and Dr. Ernest Wescott'14, who, as many of you know, during our undergraduate days were professors at M.I.T. However, I have maintained my directorship in Comstock and Wescott, Inc., so I still have a bond with Dr Comstock and his associates. Ernest died in 1950.

"Strategic Materials Corporation is a mining exploration company and has a crew of geologists discovering and investigating Canadian mining properties. The company I am now with (SUPI) is one of Strategic Materials' subsidiaries. We are carrying all the old Niagara Falls Comstock and Wescott, Inc., research accounts plus much more work for the interests of Strategic Materials. It is our job to develop processes, largely in the field of extracting metallurgy, to recover the values in the ores discovered or acquired by the parent company or its subsidiaries. While in Niagara Falls, N.Y., we do research and development on a small scale, and across the river in Niagara Falls, Ontario, another Strategic Materials subsidiary has an electric prototype plant equipped with 1,000 K.W. electric furnaces where experimental work on a carload lot scale can be carried out to determine know-how, costs, etc., on the developments where such scale work is indicated from results in our Niagara Falls, N.Y., laboratory on a 100 K.W. furnace scale. Strategic Materials has acquired the patents and patent rights to the Udy processes for beneficiating low grade ores, many of which are located in Canada. For example, Strategic Materials, through its subsidiaries, owns an enormous deposit, some 50,000,000 tons or more, of low grade manganese ore in the province of New Brunswick. Currently we are applying the Udy process to this ore, looking toward a 200-ton per day smelter to be located at the mine in New Brunswick. Marvin J. Udy, the inventor, is a long-time friend of mine."

In response to a letter from your Secretary in which we mentioned that "the supply of material is low," Walter Littlefield writes from Auburndale that "as far as that pertains to news, your 'supply' is mountainous compared to mine. At this stage of life I'm beginning to feel that 'no knews is good news.'"

Back in February, the Boston Evening *Globe* showed a picture of our Dr. Raymond D. Blakney with the following interesting caption: "A native of Boston and president of Olivet College, Olivet, Mich., has been named president of Orlinda Childs Pierce College for girls at Elleniko,

Athens, Greece. He graduated from M.I.T and Boston University School of Theology." Raymond has certainly contributed to the widening of the wide range of activities of the Class of 1916.

Herb Gfroerer continues active in public affairs. In the March 6 issue of the New Haven *Register* it was announced that Herb, as chairman of the public information department of the New Haven chapter, American Red Cross, would be the principal speaker at a meeting of the Cheshire Rotary Club which was scheduled the next day in Waverly Inn. The announcement goes on: "Gfroerer will discuss 'Red Cross in the Community' in conjunction with a Red Cross filmed report. He is a graduate of M.I.T. and served as chairman of the board and executive of SoundScriber Corporation, which he organized in 1940."

In the February 1957 issue of the *Rhode Island School of Design Alumni Bulletin*, a very attractive presentation, we see on page four a picture of our own Elizabeth G. Pattee, who is associate professor of landscape architecture and head of the Lowthorpe Department of Landscape Architecture since 1945. The caption mentions, "Mrs. Pattee is a practicing landscape architect and architect and a graduate of Massachusetts Institute of Technology."

Earl Townsend answered our call for news with the following: "I am still with the Factory Mutual Engineering Division and travelling from coast to coast and from the Gulf to Georgian Bay. Escaped the severe New England January weather with a trip to Florida and was favored with the kind of weather the tourist folders advertise. It being a business trip, there was little time for recreation, but did manage a Saturday afternoon at Hialeah and an evening at the *jai alai* games, an unbelievably fast sport played by Latins. Both the Hialeah track and the *jai alai* games are accompanied by the parimutual system, but I am able to report no financial disaster. I had a Sunday in Havana which may be reached by Pan American in an hour, and so extended my education of Latin America, having previously visited Puerto Rico and Mexico. The family situation is similar to the last report; wife, four children, and six grandchildren. The latter group was increased by two boys, one by son David and one by daughter Eunice. As the first four grandchildren were girls, it was nice to have a change of species."

More and more, as expected we suppose, letters start off by saying, "I've retired." This is so for the letter received from Joe Meigs, who has retired from the practice of patent law. He writes from Sharon, Conn., "a beautiful town in the foothills of the Berkshires." Joe says he has not been too well since retirement, regrets he will not be able to attend the 41st this June, and urges any classmate who gets in the vicinity of Sharon to drop in for a visit. He reports with pride that his son is a commander in the U.S. Naval Air Force.

Early in April your Secretary received a card from Harold Mills, postmarked in Yuma, Ariz., and noting that he was having a stopover to have his speedometer fixed. Didn't mention whether or not the needle was bent. He had been taking pictures of Superstition Mountain, site of the legendary "Lost Dutchman Mine." He and his wife were on a trip to California where their two daughters are living.

About the same time we picked up an item regarding Joe Barker and some research grants, which said in part: "Research Corporation distributed $1,243,275 in 377 grants last year to aid basic research in science, Board Chairman Joseph W. Barker said in the foundation's annual report released over the week end. The foundation receives the bulk of its money from its wholly owned subsidiary, Research-Cottrell, Inc., manufacturers of electrical precipitators and other industrial gas-cleaning equipment, and from patents it administers for universities and individual inventors."

It was good to have word from Joseph Brodil, who wrote us recently from Riverside, Calif.: "As to your request for news of my activities, I doubt if I can be of much help. Having been in retirement for nearly 15 years, my interests have been chiefly devoted to hobbies such as chess, dominoes, gardening, etc., etc., to while away the remaining years as pleasantly as possible, with social activities at a minimum. Not a very exciting nor an active life but one in which contentment and happiness have been found."

We continue to have new reasons for being proud of Vannevar Bush. Early this spring the newspapers carried the following: "The election of Dr. Vannevar Bush as chairman of the corporation of M.I.T. was announced today. He is widely known as professor, dean of engineering, and vice-president of M.I.T., director of the office of scientific research and development during World War II, as first chairman of the post-war research and development board, and as president of the Carnegie Institution of Washington."

And Ralph reports he's had word from William Bowditch in Seattle, wishing us luck in getting the boys to write for the column, and noting that arthritis has retarded his activities since he retired several years ago. "Buck" Bucknam sends a word of encouragement from Western Springs, Ill., saying that the 1916 column is the first thing he reads when The Review arrives. He goes on: "My hobbies are bowling (with a large ball) in a Legion league, and bridge. We have a duplicate club of 13 members and meet twice a month except in the summer. The host does not play. It is about 25 years old and odd in that there are no prizes, gambling, or drinking. I am looking forward to retirement in a couple of years to Auburn, Calif., about 100 miles west of Reno, Nev. The two attractions are climate and my daughter and family (two grandchildren) who live in Reno."

After a long period of silence, we have had word from Ed Jenkins in Swampscott. He retired some time ago from Convair out in San Diego, and says that his conditioning in California for so many years was so pleasant, he may go back there some day. Winters in Massachusetts were all right when we were growing up but now they are more wintry than he likes. Mentions he has seen Frank Hubbard more frequently over the years than any other '16er, and expects to see Ernest Gagnon this summer.

We recently heard from Val Ellicott who has, in addition to his S.B. degree from Tech, an M.D. and a Dr. P.H. degree. He has been directing an important part of the program of the State of Maryland Department of Health, as will be noted from his message: "Since leaving M.I.T. and studying medicine, I have kept entirely in Public Health and have felt most thankful for the inspiring teachings of Professor Sedgwick, who was our chief in Course VII. At present I am in charge of the Maryland State Health Department's Chronic Illness and Hospital and Medical Care Programs, and trying to help our State meet the challenge of providing for the needs of the aged and chronically ill."

Some facts and figures in the December 1956 message of Theodore T. Miller, President of the Alumni Association, seem worth repeating: "What do I mean when I speak of the M.I.T. Alumni Association? I mean a body of 47,000 members, of whom 1,500 hold positions in Class or Club organizations, are representatives of the Alumni Fund, or members of the Educational Council. Thousands of others are supporting M.I.T. in other ways, most without official title. One can never be sure how many M.I.T. students were attracted to the Institute by our Alumni, but last year, 2,600 applicants for admission were counseled individually by 678 active members of the Educational Council. Their responsibilities are to maintain active, friendly relations with secondary schools, and to interview prospective freshman students. Six hundred of last year's applicants they interviewed are members of this year's freshman class. And what about Educational Counselors themselves? Sixty-nine are company presidents, sixty-two, vice-presidents, fifty-nine, owners or partners. Neither can one be sure how many of the gifts to a university are influenced by Alumni. However, the Institute this past year received $3,650,000 from or on behalf of Alumni, entirely apart from the $575,000 reported through our annual Alumni Fund. Incidentally, M.I.T. now ranks around the top half-dozen colleges in the country on the basis of Alumni giving."

We regret to report that Frank Chandler of Marblehead passed on back in March. We had word from him not so very long ago, and have had a constant reminder of him on our desk in the form of a very attractive upright paperweight, with our M.I.T. seal and a "Class of 1916" designation, that he distributed to all at our 35th Reunion. Frank was past-president of the Marblehead Rotary Club, and was a heating engineer for the John S. Martin Company. He leaves a son, Frank W., of Marblehead, and a daughter, Mrs. Dorothy Bardwell, of South Bend, Ind.

Just before going to press we received from Izzy Richmond a supply of *new* 1916 stationery – a beautiful layout in Tech colors, red printing on heavy gray stock, with three really sharp pencil renderings at the bottom; the first dated 1866 showing the Rogers building, the second dated 1916 showing the initial Tech buildings in Cambridge, and the third dated 1956 with the new modernistic auditorium on the

campus. Letterheads like this will give your officers a continuing urge to write and write! Thanks, Izzy, for a big contribution to better work here.

And so the column comes to a close for this issue. Messages have continued to come from many sources and are much appreciated. The column is what you make it; write a little but write often to — HAROLD F. DODGE, *Secretary*, c/o Bell Telephone Laboratories, Inc., 463 West Street, New York 14, N.Y.

1918

All day long the wind has felt the high spirits of spring as it raced down the slope of Mt. Monadnock to sweep the last bits of ice from the surface of Thorndike Pond. The robins are back, the Crocuses and tulips in the garden are up, there are only patches of snow left in the woods, and it is — as always — something of a task to realize how different the world will be when these notes reach your reading lamp. It is only in the desert of an unfulfilled heart that time stands still. Roy L. Johnson, who came to M.I T. to sample mechanical engineering after having sampled the classics at Dartmouth, was recently promoted to vice-president of the National Life Insurance Company, in charge of personnel, purchasing, and planning the company's new home office. After an understandable interlude due to the first World War, Johnson joined his father in publishing the Randolph, Vt., *Herald and News*. In 1937 he joined National Life as purchasing agent, to be given the additional responsibility of personnel 10 years later. Now, in accordance with the already-established precedent of a 10-year interval, he has a new promotion.

George Murray, of Milton, Mass., is in the news again, and once more because of being chairman of the Board of Assessors. This time he seeks re-election for a three-year term, to place atop the 21 years he has already served. In accordance with well-tested political procedure, his campaign rests solidly on arousing the citizenry to the danger of electing an inexperienced man to replace an old wheel horse who knows how to keep the harness tidy and taut. Looking at the record, we also find that George has lived in Milton for half a century, served as chairman of the Board of Selectmen, and was for five years chairman of the Board of Appeals.

Included in the assists which The Review generously offers its Class secretaries is a newspaper clipping service. Thus, it comes about that sometimes this chronicler receives reports of a speech he has made somewhere two or three months previous. The mystery comes about when one endeavors to speculate on the method of selection, for usually the coverage is light and the important assignments overlooked. We do get around, however, as you will realize by a few moments contemplation. By actual count we gave 59 lectures last month. We wish that at least one had taken us to New York, for then it would have been possible to drop in on Sax Fletcher who has recovered nicely (we hear) from an operation on his lower machinery. We must all expect these things more frequently now.

What brought me up with a round turn as to how time has gone by was being invited to an open house last New Year's afternoon, and discovering that the young people were invited for the evening! Meeting former students who have risen in the world has no such effect. For two years now it has been my good fortune to have a professional connection with the Barre Wool Combing Company where John Gould'37 is in charge of research. Last January I wrote the '37 class secretary a letter about Gould which got mangled between here and the pages of The Review to the extent of saying that he lives in my town instead of Barre, Mass., and which, among other things, wholly omitted the important paragraph which is hereby reproduced from my carbon copy. Class of '37 please note. "But what I want most is to pay a deserved tribute to Gould as a person. Over the last five months we have worked together on an unusually difficult and delicate human problem. The wisdom, helpfulness, and kindness with no trace of weakness which he has exhibited at every stage of the task has made it a joy to work with him."

Earl Richards, alas, did not recover from his operation. (See May notes.) He died March 4 in the Mt. Carmel Hospital at Columbus, Ohio. Leslie Marshall says that, "Earl was a tower of strength to the local M.I T. group. He was local secretary and chairman for years, giving unstintingly of his time and effort. His loss will be sadly felt by us all." His wife, two sons, two daughters, and five grandchildren survive him. He was a trustee of Denison University, partner in the architecture firm of Richards, McCarty, and Bulford, and for many years active in the Baptist Church. Edwin M. Newton, an architect who became an investment banker, died February 13 in Boston. Ed was born in Little Rock, Ark.; graduated from Brookline High before going to M.I.T.; served as a lieutenant in World War I; worked a while for Harris, Forbes and Company; finally founded his own firm. He is survived by his wife. To this sad chronicle must be added four more names concerning whom I have scant information. John H. Chase of San Diego, Calif., died on February 7. Vincent S. Harriman of Brockton, Mass., died January 23. John A. Sargent of Chestnut Hill, Mass., died January 8. Maynard L. Smith, whose news has been slow in arriving, died May 13, a year ago. — F. ALEXANDER MAGOUN, *Secretary*, Jaffrey Center, N.H.

1919

Ken Wood writes that he is still with the Rexall Drug Company, but has been transferred from Boston to St. Louis. Nostalgia creeps into the closing line of his card: "Looking forward to returning to good old New England in a few more years." Stan Weymouth says, from Augusta, Maine, "No news from this korner of the kountry. Completing my 38th year with the Maine State Highway Department." He reports that he has learned that Henry E. Wilson lives up that way at Kezar Falls, Maine, and that he hopes to track him down sometime this summer.

Jim Strobridge's card reads, "Nothing new to report — same old stuff, same old place." But he does say he gets to the Tech Club about once a month. We hope to run into him there some day soon. Alan Richards sends along his new address: 717 Pickford Street, Madison, Wis. Al sends greetings to all former classmates. L. R. Sorenson is marching right along at the Newport News Shipbuilding and Drydock Company. He was recently made general manager there, and has been one of their vice-presidents since early last year. We thank E. B. Rowe'06 for this news; also the *Marine News*.

George Irwin has taken off for warmer climes, we note. His new address is P.O. Box 882, Delray Beach, Fla. We noted in the report issued at the end of February by the M.I.T. Alumni Fund that our Class has been doing better in 1957 than it did in 1956. But if you haven't already sent in your contribution, please do so right away. Let's make a *real* showing for the Class of '19. — E. R. SMOLEY, *Secretary*, The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

1920

At the April convocation to celebrate the fifth anniversary of the School of Industrial Management, several of our distinguished classmates were among those present. It was, of course, easy to pick out Ed Farrow who has lost none of that distinguishing height and is, if anything, handsomer than ever. Then there was the equally dapper and distinguished Bob Patterson, and I also caught a glimpse of Tony Anable who was looking very well indeed with a deep tan, whether from vacationing in the south or from early sailing on the Sound, I don't know. Another one who is hard to overlook in even the biggest crowd was George Dandrow, fresh from his M.I.T. junkets in Cuba and Mexico. Other notables were Perk Bugbee, Harold Smiddy, Bat Thresher, and our distinguished Dean of Engineering, C. R. Soderberg, who was at the head table. It was a particular pleasure to have a visit with Merritt Taylor whom many of us had not seen for some time. Merritt is president of Taylor Fibre Company, Norristown, Pa., and has many other interests in the gas and transit industries. He told me he was going to enjoy an extended vacation at his home in Blue Hill, Maine, this summer.

Referring again to Tony Anable, he has recently terminated his association as director of Public Relations for the United Fund of Stamford, Inc., and is going to be engaged in consulting work in the Stamford area. He has been retained by Dorr-Oliver, Inc., to complete their training program for a new technical staff. Tony has long been active in Stamford affairs. He is a member of the Stamford Rotary Club, the Midtown Club, the Stamford Good Government Association, and is treasurer of the Mianus River Gorge Conservation Committee. Professionally, he is a member of the American Institute of Chemical Engineers, and the American Institute of Mining, Metallurgical and Petroleum Engineers. Speaking of Stamford, Bat Thresher was the speaker at a meeting of the M.I.T. Club of Fairfield County recently.

Ray Reese has been awarded the Alfred E. Lindau Award of the American Con-

crete Institute "in recognition of his years of coordination of practice and instruction to text books and technical papers on reinforced concrete." Ray has also been appointed chairman of the American Concrete Institute's Committee on Building Code Requirements for Reinforced Concrete, which is the basis for codes all over the country. He has been an authority on reinforced concrete for many years, has authored books on the subject, and has lectured at the University of Toledo. During his career he has designed many buildings, including schools, hospitals, industrial plants, college dormitories, and grain elevators. Among them are the University of Toledo, American Legion Headquarters in Washington, and the Nation-Wide Insurance Building in Columbus which was the prize office building in the year it was erected. He has also been a consultant to Hausman Steel Company of Toledo for 30 years. Ray is going to Europe this summer to study codes and practices in European countries and to attend a symposium in Stockholm.

Ned Cochrane, the Institute's vice-president for Industrial and Government Relations, was a featured speaker at the Public Affairs Conference held at Bates College earlier this year. He spoke on the subject of automation. Lauren Hitchcock, who was formerly a New York consultant and more recently president of the Air Pollution Foundation, has opened an office at 3370 Deronda Avenue, Los Angeles, to assist management in a variety of technical developments in the process industry. The Reverend Franklin Blackmer has left Andover, Mass., and is now at Wayfarer Chapel, Portuguese Bent, Palos Verdes Estates, Calif.

Larry Boyden is in Punta Gorda, Fla. Wendell Sammett has also been in Florida, and whether or not he has left Flushing, N.Y., for permanent residence in Sarasota, I do not know. Harold Bower has moved from Melrose to Ipswich, Mass., 77 Fourth Street, Little Neck. In our freshman days when everyone was seated alphabetically, it used to be Bower, Bunker, and the Bugbees. I'd like to hear from both Bower and Bunker sometime.

It is with sorrow that I report the death of Bill Schimmelpfennig who had been living in Puerto Rico. He died on February 4.

Please make note, any of you who come to Boston, that your secretary has changed his business address after 29 years at the Statler Office Building and is now at N. Nine Newbury Street, at which address he will be happy to accord a warm welcome to any classmate. — HAROLD BUGBEE, *Secretary,* 7 Dartmouth Street, Winchester, Mass.

1921

If you can still make our June 10 date for the Class party on Alumni Day on campus in Cambridge, drop everything and run, do not walk, to the nearest transportation that will take you back to Tech. Never mind the reservations or the time or the program — just get to Cambridge somehow and ask the first '21er you see there for details! If you must know, you can register in the lobby of the Rogers Building. You'll find last-minute notes of 1921 activities on the bulletin board there, along with the roster of members of the Class in attendance. We'll get together for luncheon in Du Pont Court, we'll meet again before dinner, and we'll sit together at the banquet. Hurry, hurry, hurry, for the morning conferences on physical sciences, for the dedication of the Karl Taylor Compton Memorial, to see and hear the wonders of the new Kresge Auditorium with the Boston Pops and Arthur Fiedler conducting, and many more attractions just for you, your wife and your family. Come one, come all. 1921 welcomes you!

Edwin T. Steffian, Boston architect and active assistant secretary of the Class, says that he and his committee of Chick Dubé and Roy Hersum are getting detailed information together for the proposed special 1921 reunion in Havana, Cuba, in February of 1958, and a résumé of these facts and figures will be available shortly to those who have already indicated their interest in attending. Write to Ted at the address at the end of this column if you have not previously answered the Class letter and indicated that you might attend. Says Ted: "We know we can arrange an enjoyable trip and we hope that interest in this unusual gathering will spread throughout the Class. The number of tentative participants is most gratifying and we are looking forward to an outstanding event." Ted also has an announcement from the Framingham *News* of March 26, giving details of the election of Dana C. Huntington as president and a director of the Dennison Manufacturing Company. Dana was first employed in the Cost Department, and successively held various positions in the company's warehouse, planning, and paper box divisions. He was named manager of the box division in 1934 and was first elected a director in 1943. He became director of sales in 1949 and director of marketing in 1952. His election as vice-president came in 1954, and in 1955 he was made executive vice-president. He is also managing director of the Dennison Manufacturing Company Limited of London, England. During World War II, Dana was chairman of a Government committee on packaging, working with the Naval Munitions Board and the Army Ordnance Corps. He has been active in various trade associations and is currently serving on the Industrial Problems Committee of the National Association of Manufacturers. He has been president of the Marlboro (Mass.) Rotary Club and a director of the Framingham Community Chest.

Through the courtesy of Edward B. Rowe, Secretary-Treasurer of the Class of 1906, we have a most welcome letter with the detailed announcement of the appointment of Norborne L. Rawlings as executive vice-president of the Newport News Shipbuilding and Drydock Company as of the first of this year. Norborne has relinquished his previous additional duties as general manager and is devoting his full time to the administrative affairs of the vice-presidency. Many thanks, Ed. Hilliard D. Cook, formerly of Phoenix, N.Y., and now a member of the faculty of the School of Forestry of North Carolina State College, and lecturer and consultant on pulp and paper technology, reports that he has a new home at 1820 White Oak Road, Raleigh, N.C. John N. Worcester, partner in the firm of Sullivan and Worcester, has announced that their new address is 185 Devonshire Street, Boston 10, Mass. New addresses have also been received from Charles F. Parker, Ernest A. Pearson, and Harry M. Witherow, and are available on request to your Secretary.

Ralph M. Shaw, Jr., of Philadelphia and Beverly, N.J., writes from North Miami Beach, Fla.: "I became a grandfather on January 22 at 9 A.M. His name: Ralph Martin Shaw Scott. His father is Captain Robert, in the Air Force in Hawaii. Birthplace: Philadelphia." Congratulations to Rufe and Madeline, to the young couple, and to the new arrival! We had a grand reunion with Colonel Harold O. Bixby at the Institute of Radio Engineers Show at the Coliseum in New York City. Bix is director of his own firm, H. O. Bixby Associates, 238 Main Street, Cambridge 42, Mass., consultants to the electronic industry. That he is meeting the challenge of this ambitiously large endeavor is evidenced by the recent opening of a New York office at 30 East 9th Street, telephone Gramercy 9-3374. We know that all of his many friends in the Class join us in extending sincere sympathy to Bill Rose of Milford, N.J., on the recent loss of his mother.

Lawrence W. Conant, engineer at the U.S. Army Corps of Engineers Research and Development Laboratories, Ft. Belvoir, Va., is in the news for receiving an award and certificate for his idea for improving the library service at the laboratories and reducing the cost of obtaining specific information. Larry was civilian post engineer at Ft. McNair before coming to his present post. He is the founder of Dad Coached Clubs, Inc., and also of the Academy of Organizational Science. The Conants have four children. Bill, M.I.T. '48, is with the Naval Gun Factory in Washington, D.C.; George is with Revere Brass and Copper Company in Chicago; Peggy lives in Philadelphia, and Spicer is at home. By this time, we all hope that Ed Farrand, our Class Agent, is back to normal. In the interim, all due thanks go to Frank B. Kittredge, Boston District Sales Manager, Jones and Laughlin Steel Corporation, for his loyal and timely cooperation in carrying on the duties of the Class Agent. Your annual support of the Amity Fund is the surest way to tell these fellows how much you appreciate their efforts in your behalf. We note, belatedly, that Jack Barriger, President of the Pittsburgh and Lake Erie Railroad, traveled down to Tulsa, Okla., to take part in the M.I.T. Regional Conference in which Bill Sherry, "Mr. M.I.T. of Oklahoma," had such a prominent part.

It is with heavy heart that we record the passing of two members of the Class and extend to their families the sincerest sympathy of the entire Class. Commander Thomas Harry Frost, U.S.N.R. (Retired), died at Naples, Fla., on February 4, and was buried with full military honors at Arlington, Va. Born in New York City on December 21, 1895, he prepared for Technology at The Citadel and joined us in the junior year. He had been a first lieutenant of Infantry in World War I and served in the Meuse-Argonne offensive

with the American Expeditionary Force. He was graduated with us in Course X and obtained his master's degree in the same course. It was as professor in the Graduate School at the Institute, teaching physics to naval officers selected for advanced study, that he began his association with the Navy. In 1942, he was called to active duty to design and build our first mine countermeasures activity, the Naval Mine Warfare Station at Solomons, Md., where he also served as the first countermeasures officer. After two years of service there, he was assigned to the Bureau of Ships where, in 1946, he became head of the Mine Sweeping Branch. Largely as a result of his efforts, a site on St. Andrew Bay was selected for the central laboratory for mine countermeasures work. He became the Navy's most aggressive spokesman for the mine countermeasures program, and credit is given to him for the growth of the laboratory and its ultimate designation as the Mine Defense Laboratory. We quote in full a letter sent to M.I.T. by Captain J. C. Myers, Commanding Officer of the Laboratory, located at Panama City, Fla.: "This Laboratory was the last duty station of the late Commander Thomas H. Frost, U.S.N.R., as well as the scene of his last efforts in the science field. During the nineteen-forties, while he served in the Navy Bureau of Ships, he came to be known as 'Mr. Minesweeping' to those in mine defense, both in Washington and in the field.

"Shortly after his death, a number of his acquaintances at various government activities decided spontaneously that some gift to the Institute where he had taught would be a fitting gesture of respect in place of the customary funeral flowers which circumstances made most difficult to send. A check for $150 is enclosed for the general scholarship fund from the personnel of this command." Captain Myers also sent a copy of the Laboratory newspaper, with the announcement of Commander Frost's death, and a special lithographic memorial with a sketch of Commander Frost and this tribute: "Today we say a final farewell to an old and dear friend, Commander Thomas H. Frost. This man, loved by so many and honored by all, leaves in his wake memories of the scholar, teacher, officer, builder, and leader of men. A proud man, yet humble in the presence of learning; an ambitious man, although unswerving in loyalty to friends and duty; a rugged man, yet mild with compassion for the unfortunate. Gone is the teller of tales, counselor of man and boy, teacher to all, old sailor and gentle friend. Rarely has one man given so much to his fellows – and seldom will so many know so great a loss."

Simeon Edmund Travis, Jr., of Ft. Worth, Texas, died on March 10, 1957. A native of Hattiesburg, Miss., he was associated with us in Course VI. For many years he had been engaged in engineering and airport development with the Civil Aeronautics Administration, and was chief of the Airport Division for five states in Region IV at the time of his death. He was a member of the Sigma Chi Alumni Club of Ft. Worth and of the Quiet Birdmen Hangar Club. He had been president of the M.I.T. Club of Ft. Worth, and was honorary secretary of the Institute, and regional chairman of the Ft. Worth area. He is survived by his wife; a son, Robert, a graduate of Texas Agricultural and Mechanical College and a first lieutenant with the Air Force; and a brother, J. K. Travis, of Hattiesburg.

Final call: Come to Cambridge and join the Class on Monday, June 10, on Alumni Day! – CAROLE A. CLARKE, *Secretary,* Federal Telephone and Radio Company, 100 Kingsland Road, Clifton, N.J. EDWIN T. STEFFIAN, *Assistant Secretary,* 11 Beacon Street, Boston 8, Mass.

1922

Dr. Ram Prasad's daughter, Sheila, is studying at Harvard for her Ph.D. in electromagnetic radiation. Sheila, like her mother, is a Radcliffe graduate.

General William M. Hoge has joined the staff of Interlake Iron Corporation of Cleveland, being elected in April to the post of board chairman. General Hoge was in command of the landing of American forces on Omaha Beach on D-Day, and, during the winter of 1944-1945, he was combat commander of the 9th Armored Division participating in the Northern France, Ardennes, and Rhineland campaigns. It was his command that captured the Remagen Bridge before it could be demolished by the retreating Germans. As a lieutenant general he participated in four campaigns in the Korean war, and after becoming a four star general in October 1953 he became commander-in-chief of the U.S. Army in Europe and commanding general, Central Army Group, NATO. He retired in 1955 after 39 years of active duty commencing with his graduation from West Point in 1916.

Latimer F. Hickernell, Chief Engineer of Anaconda Wire and Cable Company, Hastings on Hudson, N.Y., has been nominated for the office of treasurer of the American Institute of Electrical Engineers. Upon graduation from M.I.T. he joined the graduate student engineer course of the General Electric Company in Lynn. In 1923 he entered the engineering department of the Consumers Power Company, Jackson, Mich., and the following year went with Commonwealth Power Corporation of Michigan and its succeeding companies, Stevens and Wood, Inc., and Allied Engineers, Inc. In 1931 he joined Anaconda, becoming chief engineer in 1933. Since then he has served on many committees of the National Electric Light Association, the American Society for Testing Materials, the National Research Council, the Insulated Power Cable Engineers, and the American Institute of Electrical Engineers. Since 1953 he has been on the A.I.E.E. Board of Directors.

The May issue of the *American Mercury* magazine carries an article on "We're Wasting Our Engineers" by William Elmer as told to Cathleen Burns. Cathleen is Bill's brilliant writer-wife, and she did such a masterly job of organizing and editing Bill's ideas on the subject that he got a headline on the cover of the magazine.

The following '22 men, among others, attended the convocation celebrating the Fifth Anniversary of the School of Industrial Management held at the Institute on April 9: Frank Kurtz, Whit Ferguson, Buck Eacker, Crawford Greenewalt, George Dandrow, Tom Craig, Ted Miller, Fred Blackall, Ab Johnson, Ed Fales, and Bob Tonon. Incidentally, Bob Tonon's daughter, Tina, graduates from Skidmore on June 9, while another daughter, Cathy, graduates at the same time from Winchester High School.

We have just received belated word of the death of Marcus A. McClure on December 1, 1954. His home at that time was West Los Angeles, Calif. – C. YARDLEY CHITTICK, *Secretary,* 41 Tremont Street, Boston, Mass. WHITWORTH FERGUSON, *Assistant Secretary,* 333 Ellicott Street, Buffalo, N.Y.

1923

Probably you read the tribute to Dr. Julius A. Stratton, VI, that appeared in President Killian's report on the state of the Institute. Even so, it will not hurt to read it again: "The most notable event of the year was the election of Dr. Julius A. Stratton to the newly established post of Chancellor, an action which was taken by the Corporation at its June meeting. As Chancellor, Dr. Stratton administers the Institute's academic program in all its parts with all academic officers coming under his jurisdiction. In addition, he serves as deputy to the President, who is the Institute's chief executive officer. The Chancellor serves as the general executive officer for all Institute affairs, and, in the absence of the President, is authorized to have all the powers and perform all the duties and functions of the President. As Chancellor he also serves as a member of the Executive Committee of the Corporation.

"The creation of the post of Chancellor for Dr. Stratton came in recognition of his great contributions to M.I.T. and his leadership in science and education both at M.I.T. and nationally. The appointment reflected the increased scope and responsibilities of the Institute, its many and unusual national obligations at this time, and the consequent need for a greater sharing and delegation of its administrative responsibilities.

"I speak with delight and enthusiasm for the still closer partnership of Dr. Stratton and myself made possible by his new status. We have long worked together with a sense of common purpose and extraordinary concert on policy. With Dr. Stratton taking the major responsibility for the internal affairs of the Institute, our joint administrative efforts will be more effectively allocated and organized."

Archibald Williams, XIII, Vice-president of the American Hardware Corporation at New Britain, Conn., was one of the seven men to receive honorary membership in the Connecticut Pi Psi Chapter of Pi Tau Sigma, National Honorary Engineering Fraternity at the University of Connecticut, March 7. Archie, who graduated from the Watertown, Mass., High School, received his degree along with the rest of us in 1923. He became instructor in the Mechanical Engineering Department and also assistant professor in the Department of Business and Engineering Administration. He has been associated with the American Hardware Corporation for the past 10 years.

Louis Skidmore, IV, was honored by the American Institute of Architects, the citation reading, "Pioneering new paths in a profession depending hitherto largely upon individual service, you have built an organization . . . in which you have united in singleness of purpose the manifold skills, imagination, and judgment fitted to serve, with marked distinction, a wider and more diverse clientele than had been thought possible. In giving architectural service to the needs of an era of vast building activity, you and your collaborators have won for the profession a wider understanding and appreciation."

Paul Heymans, VIII, is the Belgian business man who will be chairman of the *Civitas Dei,* the Vatican section of the 1958 Brussels World's Fair, according to an article that appeared in *The Pilot,* a Catholic weekly paper published in Boston. Paul has held posts of minister of economic affairs, minister of middle classes, and minister of agriculture in the Belgian government. He is chairman of the Belgian League of Large Families, and president of the International Assistance Committee of *Caritas Catholica,* the Belgian Catholic welfare agency. He is also a member of several learned societies in engineering and financial fields.

We regret to report the death of George L. Browning, X, at Goleta, Calif., and James W. Pratt, II, at Seattle, Wash. No other details are presently available.

Alumni Day, June 10, will have come and gone by the time you read these notes. Hope to see many of you there. We must start making plans for the 35th Reunion next year which, as you will recall, is to be held at Hyannis on Cape Cod. The next 12 months will roll around very, very fast. Trust you are all ready making plans to attend. The choice of location is ideal and the fellowship could not be better. — HOWARD F. RUSSELL, *Secretary,* Improved Risk Mutuals, 15 N. Broadway, White Plains, N.Y. WENTWORTH T. HOWLAND, *Assistant Secretary,* 1771 Washington Street, Auburndale 66, Mass.

1924

An outstanding event of the spring season at M.I.T. was a Convocation held in April to celebrate the fifth year of the School of Industrial Management. Among the 600 or so who attended were a goodly number of top industrialists, Alumni and otherwise, among them a few from our Class. Ed Hanley, President of Allegheny-Ludlum and M.I.T. Corporation member, was there. So were a few V.P.'s; Cy Duevel (American Thermos), Frank Shaw (Rust Craft greeting cards), and Bill MacCallum (Modern Talking Picture Service). There were also a couple of partners; Jack Hennessy (Syska and Hennessy, Consulting Engineers) and Gordon Billard (J. R. Williston and Company, Brokers). And it seems logical that your secretary as Alumni Fund director might claim a valid reason for being there. After all, a whole panel discussion was devoted to the job of the director.

A clipping from the Kansas City *Star* shows Dr. Philip K. Bates smiling happily at a little group of scientists beaming over a small bit of liverwurst. It was at a symposium on food technology and the liverwurst had been kept since last July without refrigeration. It had been irradiated, of course. The caption just says they "examined" it. No indication they sampled it. Phil, who is general manager of research for Carnation in California, was chairman of one of the sessions.

Sorry to have to report the passing of William F. Donovan. Bill had been in the Boston area for some time, but none of us here had seen him. He died on March 11 in Gloucester.

One of our three most-travelled classmates, Paul Cardinal (other two, Simonds and MacCallum), reports in after that swing around the West Coast area we mentioned in the last issue. Paul got together with Phil Bates in Los Angeles, missed Rock Hereford in San Francisco, and finally caught up with Bill MacCallum back home in New York. "Saturday evening I had a little gang of 40 of the staff (Hoffmann-LaRoche) out to my home for cocktails and a beefsteak dinner, so Bill came out. Don't know whether we'll be geting out movies for him to distribute or whether he'll be plugging vitamins for us, but we sure had a great time together." One thing's for certain; nobody needs vitamins less than MacCallum.

Coming up, as this is written, is the annual May get-together of a little group in Cambridge under the inspirational aegis of Frank Shaw, our Class agent. The occasion is the penning of notes to those of you who have not, as yet, given to this year's Alumni Fund. We've been doing rather well so far, although not up to the performance of some past years. Participation is what needs building at the moment.

Alumni Day is just around the corner. It's June 10. Hope to see lots of you there, and, for those who are Class and Club officers, or maybe Fund officials or educational councillors, keep in mind the Friday and Saturday after Labor Day. It's the Second Alumni Officers Conference at M.I.T. Should be a good show. — HENRY B. KANE, *Secretary,* Room 1-272, M.I.T., Cambridge 39, Mass.

1925

The Class of 1925 was well represented at the April 9, 1957, Convocation commemorating the fifth anniversary of M.I.T.'s School of Industrial Management. Your Secretary found the following present at the various functions held in connection with the Convocation: President Fred Greer, Past-President Ave Stanton, Ron Mitchell, Phil Niles, Admiral Theodore Lonnquest, and Maurice Freeman.

A note from Maurice Grushky indicates that he has found there is wide latitude between what we studied at Tech and what we do in the course of our active practice. He states that during the past two years, he has written on subjects which were not covered in Course I. These include a section of harbor engineering for *American Civil Engineering Practice;* the legal aspects of engineering for a book on engineering contracts and specifications; and a section on contracts and specifications for *Highway Engineering Handbook.*

The *Engineer of Southern California* reported in its April, 1957, issue that "the directors of the Los Angeles Section, American Society of Civil Engineers, have designated Finley B. Laverty as the engineer who has done the most for the Section and the civil engineering profession in this area during the last several years. Mr. Laverty, a past-president of the Los Angeles Section, is now a national director of A.S.C.E., having been elected by the membership of the seven sections in Arizona, California, Hawaii, Nevada, and Utah. Mr. Laverty has achieved a dual career as (1) a practicing engineer and (2) in the professional aspects of engineering education. Chief hydraulic engineer of the Los Angeles County Flood Control District since 1934, he is an authority on water conservation, reclamation of waste water, and flood control systems. In working for the advancement of engineering education he has carried on a variety of activities. Between 1946 and 1951, as a member and chairman of the national Committee on Student Chapters of A.S.C.E., he visited engineering colleges throughout the western United States to revive interest in student chapters which had lapsed during World War II. His committee's work is credited in large part with the 20 per cent gain in national membership of the Society which followed. In the Los Angeles area Mr. Laverty has worked effectively to develop future engineers in high schools. He initiated the yearly meetings in which practicing engineers from the Los Angeles Council of Engineering Societies provide information and guidance for science-talented students and their parents. In 1955 he was organizing chairman of the Los Angeles Technical Societies Council which now associates some 28 societies with a total membership of between 15,000 and 20,000 engineers. He also served as first chairman of the L.A.T.S.C. Education and Vocational Guidance Committee which developed, with the office of the Los Angeles Superintendent of Schools, the city's unique program for industry cooperation to further student interest in mathematics and science and to maintain adequate teaching staff in these subjects.

"A graduate of Occidental College and M.I.T., Laverty's engineering career has included work in the fields of research, design, construction and operation pertaining to dams and water conservation — also hydroelectric, water supply and sanitary facilities, and large buildings, as well as consulting on flood control and water conservation projects. Last year the American Water Works Association gave him its award for the best technical paper in the Water Resources Division. He is one of the authors of the *A.S.C.E. Hydrology Manual.*

"Finley Laverty has been chairman of a majority of the standing committees of the Los Angeles Section and its Sanitary Group, vice-president of the Section in 1947 and president in 1951. On the national level of A.S.C.E., he has been chairman of the following committees: Local Qualifications, Student Chapters, Hydrology, the Sessions Program for Conditions of Practice; a member of the Committee on Sedimentations; and vice-chairman of the Committee on Junior Members. In addiion to the societies previously mentioned, he is a member of the Los Angeles

Rotary Club, American Geophysical Union, and a director of the Los Angeles Engineers' Club.

"Although born in Wellsville, Ohio, Mr. Laverty has lived in the Los Angeles area since 1908 – which explains much of his interest in water. He and his wife, Mary, live in Pasadena. Their daughter, Sara, has recently graduated from the University of Arizona and is teaching at the Naval Ordnance Test Station at China Lake. Their son, William, is a senior at U.C.L.A. with mechanical engineering interests."

We are sorry to report the death on March 5, 1957, of Joseph B. Saunders of Keene, N.H. Joe was born in Keene on July 9, 1899, and attended Keene Public Schools. He enlisted in the National Guard on March 30, 1917, just before the United States declared war on Germany on April 6, 1917. Soon after enlistment, the National Guard unit went into making up the 26th Division, better known as the Yankee Division. He was in the 103rd Infantry, Company G, and saw service in the Soissons sector, Toul, the Marne, Saint Mihiel, the Meuse-Argonne, and Verdun. He was the first commander of the Gordon-Bissell Post No. 4, American Legion, in Keene. Upon his return from France he attended Berkeley Preparatory School in Boston and M.I.T. where he studied industrial engineering, the profession he pursued until his death. He is survived by three brothers and two sisters; John L. Saunders and Charles Saunders of Keene, Barney Saunders of Purdys, N.Y., Catharine Saunders of Palm Beach, and Mary Saunders of Boston.

It is also sad to report that on March 17, 1957, Herbert A. Lafler, VI-A, passed away. As of this date, no detailed information is available.

Among address changes received during the past month, there is one that indicates that Herbert H. Taylor, Jr., has left the Chicago area and is now located at 2042 Stella Street, Fort Myers, Fla. Edgar R. C. Ward, who has been at Fort Bliss, Texas, and was a lieutenant colonel, is now a full colonel and located in Portland, Maine. — F. L. Foster, *Secretary*, Room 5-105, M.I.T., Cambridge, Mass.

1926

Here at Pigeon Cove on this mid-April morning it is clear and crisp. We were in Florida earlier this week where we enjoyed mid-August weather for seven days. However, our rough and irregular New England landscape looks very good, and it will be looking better for the next few months. We carried a list of '26 men, but the only one we had an opportunity to telephone was Leroy Copley when we were in St. Petersburg. He is located with Babcock and Wilcox who have an engineering office there. We visited my brother-in-law, Win Southworth'26, who has recently opened an engineering office in Tampa for Gibbs and Hill of New York City. We returned via a four-hour flight from Tampa to Boston last Tuesday which enabled your secretary to attend a convocation commemorating the fifth anniversary of the Sloan School of Industrial Management. Several classmates had come considerable distances to attend – George Edmonds from Wilmington, Del., Thornton Owen from Washington, and Dave Shepard from New York. Dave was on a panel that discussed the functions of directors of corporations and as usual carried his end of the discussion masterfully. Your three Class officers, Dave, Pink Salmon, and I, had an informal get-together before dinner – the first time except at reunions we have had such an opportunity. It was enjoyable.

"Ike" Gleason wrote a fine letter in response to our card of last December, and we have been waiting for an opportunity to pass along his résumé. Ike started with International Tel and Tel Corporation, and, after training in New York and Cuba, he spent several years in telephone engineering in South America until the depression hit, at which time he shifted back to the United States with New Jersey Power and Light. The war found him back in communications, first as a civilian and then as a major in the Army. The war over, Ike again joined I.T. and T., but Korea tapped him on the shoulder for service in the Pentagon as assistant chief of the Army Communications Service Division. Ike is now back with I.T. and T. as sales manager of the Federal Telecommunication Laboratories, and is living in Mountain Lakes, N.J. Ike's family has a real M.I.T. flavor – his wife is sister of Robert H. Henderson'23, son Laurence graduated from the Institute in 1953, and son Robert is currently working for a doctor's degree in chemistry at M.I.T.

Ike's long connection with I.T. and T. reminds me of something I have meant to call to your attention. Many of you must remember Lieutenant Leavey who used to march us around in freshman R.O.T.C.; he was very much the West Pointer, as straight as a ramrod and very precise in his commands. He made a strong impression on me, and that was 35 years ago. A few months ago, turning the pages of *Fortune* magazine, I came to a full-page color portrait of "General Leavey of I.T. and T." Yes, it was our R.O.T.C. instructor, now retired from the Army and doing a bang-up job as president of I.T. and T., and in his photo he looks just the same as when he was at M.I.T.

We still have many cards from the Class, so let's publish as many as we can without comment: (1) "I was sorry to miss the 30th reunion. I am still with Scovill Manufacturing Company, Waterbury, Conn., after 28 years of having been associated with the development of continuous casting of brass billets and slabs, and continuous annealing processes. I ran into Austin Kelley at the Yale-Brown game in New Haven this fall. Ed Manning." (2) "Still doing business at the same stand – Goodyear – trying to design airplane tires to meet the exacting requirements of the aircraft of the future. Our son, Paul, is a junior at the College of Wooster (Ohio) presently majoring in philosophy. Our other son, Charles, is now trying to select a college for the fall of 1957. Lawrence S. Randall." (3) "Sorry I couldn't stop to see you the week end of January 26 when I went up to Gloucester, Lobster Point (or is it Halibut?), Salem, Newburyport, and Plum Island on a birding expedition. George W. Breck." (4) "After finishing 30 years service with Standard-Vacuum Oil Company in various Indian, Pakistan, Ceylon, and East African assignments, I expect to retire from active service with that company as of January 1, 1957. This does not mean that I propose retiring from an active life or further business connections. On the contrary – looking around for something to do where my extensive knowledge of the peoples, customs, and economics of those countries can be put to further good use either by a business organization, a government, or a fund. Present address, Warrenton, N.C., is temporary for the next few months only. W. F. Rivers."

(5) "George: I should have done this long ago! Bob Richardson – Family: Bob: Jr., married with two children. Daughter, Julie, married with two children. Daughter, Greta, married to Private Ettinger in Germany where Margie and I hope to visit in February. Business: Ethyl Corporation in charge of activities of all sorts from New Jersey thru Virginia – busy! Classmates: Telephone visit with John and Gay Longyear in Detroit last week. They plan a 'Garden Tour' in Europe next spring – Spain, Italy, etc. Had lunch with H. W. (Dick) Jones in Port Arthur in November and earlier this month in Philadelphia." (6) "Dear George: This is just to tell you that Lou Darmstadt and I held an unofficial '26 Reunion in Mexico a few days ago, along with the M.I.T. Club of Mexico City. We highly recommend Mexico as a meeting place. Regards, Bill Sessions." (7) "William W. Farr, 3 Pine Grove, Bristol, Pa. Have been for the last 17 years employed by Rohm and Haas Company at the Bristol, Pa., plant as technical service engineer for the Plastic Department. Am married to Evelyn Madden Farr, and we have one son, William W. Farr, Jr., who is a senior at George School, Newtown, Pa. Next year we hope he will go to M.I.T. (Course VI). We go to Stone Harbor, N.J., in the summer, and I am interested in fishing, swimming, and golf (P.G.A. handicap, 15), and am a member of Burlington County New Jersey Country Club. Enjoy your Class Notes and mean to look you up when in Boston." (8) "Still president and treasurer, Swanton Lime Works, Inc., Swanton, Vt. Oldest daughter, Nancy, graduating from Cornell in home economics in June. Daughter, Marion, in freshman year at Indiana University. Daughter, Sally, a junior in Bellows Free Academy, St. Albans. Revelling in a new Karman-Ghia Coupe – how do you like your VW? Chas. Rich." I'll answer Charlie's question and call it a day – the answer is that I am still awaiting delivery of my VW; the order was placed December 10, it takes at least six months. I hope The Review editors don't object to the Class of '26 usurping space because next month we will really go to town. See you then. – George Warren Smith, *Secretary*, E. I. du Pont de Nemours and Company, Elastomers Department, 140 Federal Street, Boston 10, Mass.

1928

With regret we learn of the death of Milan Tandy. Milan, who was known as "Bill" to his associates, graduated in Course I. George Palo sent Ralph Jope the following clipping from the *Engineering*

News Record of March 28: "Milan Tandy, 53, an engineer who helped erect hydroelectric plants in West Africa's Republic of Liberia, died February 13 in Louisville. He was a graduate of M.I.T., and most recently associated with Liberty Engineering and Manufacturing Company in Louisville." Ralph learned also that George Palo and his wife, Anne, are planning to attend a music festival in San Juan, Puerto Rico, with Art Josephs and his wife.

On Sunday, March 24, the 30-Year Reunion Committee met for the afternoon in Winchester as guests of Florence and Ralph Jope. Following are those who enjoyed the pleasant hospitality of the Jope household on this occasion: Bill Carlisle, Frances and Jim Donovan, Helen and Bob Harris, Alice and Slim Maeser, Mary and Art Nichols, Dorothy and Herm Swartz, Ruth and Abe Woolf (with son Burton, eight), Elva and Walter (Andy) Anderson, Gladys and Dave Olken, and Katherine and Walt Smith. Discussions were on an informal basis entirely, but the current of enthusiasm was unmistakable. Gentlemen, preparations for your 30th in 1958 are in the hands of an excellent working group! Rest assured, no effort will be spared — this is destined to be something you and yours will always remember! — GEORGE I. CHATFIELD, *Secretary*, 49 Eton Road, Larchmont, N.Y. WALTER J. SMITH, *Assistant Secretary*, 15 Acorn Park, Cambridge, Mass.

1930

Tom Connor has been appointed the first executive director of the Massachusetts Association for Retarded Children, and assumes his duties immediately at the new M.A.R.C. state office at 25 Huntington Avenue, Boston, Mass., coordinating the activities of the 26 local chapters of the Association and directing liaison between federal and state agencies and private philanthropic associations concerned with the welfare of Massachusetts' 140,000 mentally retarded children. Tom is a former Boston *Post* employee. He joined the staff of the *Post* as a student correspondent. Later, as a member of the regular staff of the paper, he served as assistant city editor, district editor, and morning city editor. In 1941 he was named director of the *Post* library and was put in charge of the staff handling editorial research and public information. One of the founders of the Boston Junior Association of Commerce and its first director of publications, Tom has also been a free-lance writer in the fields of science, engineering, medicine, education, and library science. For many years he served as a public relations consultant, specializing for the most part in technical public relations. Tom is married and the father of three children. Congratulations, Tom, and good luck in your new appointment.

Larry Gonzalez dropped us a note telling us that he has spent the last five years in Paris (interrupted by returns to the United States and vacations in Europe) with the U.S. Navy Shipbuilding Representative, Europe, on the small warship procurement end of the Off-Shore Procurement Program. He was sorry to miss our 25th reunion but hopes to make the 50th.

Sid Kaye is in the news again. He has been named events chairman of the 1957 Spring Campaign of the Combined Jewish Appeal of Greater Boston. In this capacity Sid will be responsible for the planning of all programs in connection with the fund raising activities of the C.J.A. Besides his community work for hospitals, the C.J.A., and especially the Beth Israel Hospital where he continues to serve as an orderly, he finds time to devote to his Temple — Temple Emeth — where he was president of the Brotherhood, to maintain an active role in the Stein Club, of which he is a former president, and to continue working for the Brandeis University Associates — another organization which he served as president.

Ed Mears has been named manager of the central services division of the Dewey and Almy Chemical Company, Cambridge, Mass. His new duties put him in charge of industrial and public relations, advertising, purchasing, and market research. Greg Smith has been elected president and general manager of Eastman Gelatine Corporation (a subsidiary of Eastman Kodak Company), Peabody, Mass. The firm makes gelatine for use chiefly in photographic film and paper. Greg joined Kodak in 1931 as a chemist in the industrial laboratory at Kodak Park Works in Rochester, N.Y. The following year he transferred to the Kodak Park Gelatine Department. In 1938 he was appointed assistant superintendent of the Department, and in 1949 he was named assistant to the general manager of Eastman Gelatine Corporation. The following year he became assistant general manager and was also elected a director and vice-president.

We have been notified by the Alumni Office of the following changes in address: Albert F. Bird, 5009 Spring Drive, S.E., Washington 21, D.C.; Bernabe F. Barrios, Calle Dr. Canseco 212 Nte. Tampico, Tamps, Mexico; Hamilton N. Conant, 45 Bonad Road, Stoneham 80, Mass.; William W. Driscoll, Crest Road of Winter Street, Box 522, Framingham, Mass.; Wilfred P. Eaton, Morrison-Knudsen Company, Inc., 150 E. 42d Street, New York 17, N.Y.; Major General Charles K. Gailey, Jr., Chief Civil Affairs and Military Government, Room 2B-272, Pentagon Building, Washington 25, D.C.; Lawrence N. Gonzalez, c/o Thomas H. Urdahl, 1300 Connecticut Avenue, N.W., Washington, D.C.; Edgar M. Hawkins, Jr., 214 West Pearl Street, Coldwater, Mass.; Allan Intriligator, Apartment 20A, 3180 Lake Shore Drive, Chicago 14, Ill.; Thomas F. MacLaren, 1329 Douglas Avenue, Providence 4, R.I.; Clarence H. Prescott, 200 Oak Place, Fair Haven, N.J.; Robert B. Rypinski, Chrysler Missile O.P.S., P. O. Box 2628, Detroit 31, Mich.; Dr. William E. Yellund, P. O. Box 356, Fayville, Mass. — GEORGE P. WADSWORTH, *Secretary*, Room 2-285, M.I.T., Cambridge 39, Mass. *Assistant Secretaries:* LOUISE HALL, Box 6636, College Station, Durham, N.C. RALPH W. PETERS, 249 Hollywood Avenue, Rochester 18, N.Y.

1931

Sr. Lorenzo Manzanilla-Arce writes that Merida — his home town — now has a population of a little over 150,000 and that they have just opened a road to a new Mexican port on the Caribbean Sea. Shortly, he says, they expect to have a ferry boat connection with Florida, via Cuba. He has a sisal plantation and raises Brahman cattle.

Word from Edward B. Rowe, Secretary-Treasurer of the Class of 1906, tells of Donald A. Holden's appointment as production manager for Newport News Shipbuilding and Drydock Company. Don first went with Newport News in 1934 where he worked progressively in the Machinery and Piping Design Departments. In 1939, he was made junior design supervisor; senior design supervisor in 1940; assistant chief engineer in 1948; and chief engineer in 1954.

Among our classmates who have made the headlines lately are General Bob Fleming, Gordon Brown, Julian Hastings, John Mac Brayne, and Ed Hubbard. Bob Fleming, who had a leading role in directing the repairs of 1955 flood damages, was the principal speaker at the March 11 meeting of the Western Massachusetts Section of the American Society of Mechanical Engineers. He discussed "Flood Control." Gordon Brown, Head of the Electrical Engineering Department at Tech, has talked to various groups on engineering education. Julian P. Hastings was elected to the Framingham Board of Assessors recently, and Ed Hubbard has become a stockholding partner with Coffin and Burr. News of John Mac Brayne was received by way of T.A.P.P.I., the Technical Association of the Pulp and Paper Industry, where he has presented several papers. John is in charge of industrial engineering for Union Bag and Paper Company.

New addresses received since our last letter are: William A. Brown, Jr., Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago 14, Ill.; Smedley D. Butler, Jr., 104 Radner-Chester Road, Radner, Pa.; Leonard D. Christie, Jr., 35 Mayflower Parkway, Westport, Conn.; Albert F. Coleman, Cotswold Lane, Haddonfield, N.J.; Edward F. Coy, 4425 Gaywood Drive, Forest Hills, Hopkins, Minn.; Enright A. Ellis, Rt. #1, Box 98 E. Mulino, Ore.; Colonel Irvin W. Finberg, Engineering Division, Headquarters Base Section, U.S.A. Com., A.P.O. 44, New York, N.Y.; Colonel Waman S. Hassett, North Main Street, Petersham, Mass.; Richard L. Lankes, 797 County Road, #9, Victor, N.Y.

Professor Charles H. Norris, M.I.T., Room 1-253, Cambridge 39, Mass.; Lieutenant Colonel Charles Robbins, C.W.L. Army Chemical Center, Edgewood, Md.; Paul T. Semple, Apt. 162, 3730 — 39th Street, N.W., Washington 16, D.C.; John T. Sherman, 4424 Stanford Street, Chevy Chase 15, Md.; John A. Shute, 3536 Edmunds Street, N.W., Washington 7, D.C.; Benjamin W. Steverman, 260 Morrison Drive, Pittsburgh 16, Pa.; Samuel Waldman, 608 E. Haley Street, Midland, Mich.; Lieutenant George C. Weaver, 3709 Woodstock Street, N., Arlington, Va. — EDWIN S. WORDEN, *Secretary*, 9 Murvon Court, Westport, Conn. GORDON A. SPEEDIE, *Assistant Secretary*, 90 Falmouth Road, Arlington 74, Mass.

1932

The New York M.I.T. group staged a pre-reunion reunion at the M.I.T. Club of New York's Hotel Chatham facilities on Thursday, March 28. The committee for the dinner comprised Ed McLaughlin, Harry Moore, Al Mulliken, Jim Shackelford, Harold Traver, and Willard Meyer. Others in attendance were: Maurice Cook, Martin Meyer, Charles Martin, Bob Strong, Bill Heidtmann, Charles Bradley, Lawrence Littlefield, Eustace Corson, Ed Eddy, Willis Moore, G. Fraser Casey, Minot Bridgham, John Griswold, Clarence Chase, Bob Thompson, John Graham, John Loustanau, Lawrence Whitaker, and Stanley Johnson.

Tom Sears, Rolf Eliassen, and Ed Nealand came down from Boston to tell the group about the Reunion plans. Rolf showed about 20 slides of the Institute and discussed some of the student, teaching, and research statistics of 1932 and 1957 to give the men an idea of what they can expect when they come to Tech in June. Tom Sears talked very frankly about the need for each Alumnus to investigate his capability to increase his contribution to the Class Gift. Things are not going as well as we had hoped, and many who have made just a casual gift can and should give a great deal more so that we can reach our goal of "$32,000 for '32." It was a fine turnout and it was hoped this might be only the first of other 1932 New York get-togethers.

Many of our classmates who attend the Reunion will be coming from considerable distances, but I don't think anyone will beat Juan Serrallach, who has just written to us from Barcelona, Spain: "For you who live in the States, this 25th Reunion may be extraordinary, but for me, who have not been back since I left in 1932, it is an event. So, please, take note that I will attend with the hope of seeing you all back, as I myself, with more greyish hair, but with the same old spirit."

Arch Archambault and Bob Semple were principal speakers at the National Industrial Research Conference held at the Conrad-Hilton in Chicago on April 24 and 25. Arch spoke on "Research and Sales," and Bob on "Research is a Personal Matter." This conference, which is designed mainly to emphasize the top administrative aspects of research, has now become an annual affair. It is sponsored by the Illinois Institute of Technology.

Incidentally, advance material on the program revealed that Arch was awarded the Medal of Merit at the end of World War II, which is the highest decoration the United States Government can give to a civilian. In 1941 he had been sent to England to head the European activities of the Office of Scientific Research and Development. He had one exciting moment. In 1944 he and three other Americans wandered into a radar station on the Brittany coast. They found it loaded with German soldiers. When Arch told them, however, that an Allied armored column was approaching the installation, the Germans decided to surrender.

Bob Minter, Captain, U. S. Navy, retired in July, 1955. He is now with the firm of Waddell and Reed, Inc., investment brokers in Miami, Fla. That perennial performer, Al Halper, has just received the Practical Builders "Oscar" as the nation's top new-home merchandiser. The award was made in late February. Al received his trophy from Charles Pieper of Ashland, President of the Home Builders' Association of Greater Boston. This is the top annual presentation given by this Association. Al has recently moved and now lives at 5 Wiswall Road, Newton Center, Mass.

Johnny Kearns has just been made manager of a new district sales office at San Francisco for The Bristol Company of Waterbury, Conn. John has been with Bristol since 1936 serving as sales and service engineer at the company's New York, Birmingham, and New Orleans offices. Before joining Bristol, John was first associated with the General Electric Company and then later was an instructor in electrical engineering at the Bridgeport (Conn.) Engineering Institute. — ROBERT B. SEMPLE, *Secretary*, Box 111, Wyandotte, Mich. *Assistant Secretaries:* WILLIAM H. BARKER, 45 Meredith Drive, Cranston, R.I. ROLF ELIASSEN, Room 1-138, M.I.T., Cambridge 39, Mass.

1933

Press reports continue to come in about Ivan Getting who served as an expert for the young man who continues to win more money each week, at this writing, on one of the popular quiz shows. While it may seem presumptuous, your editors suggest that Ivan might appear more profitably on the same show as a contestant himself. Bob Forbes reports from Fountain City, Tenn., that he is working for the Tennessee Valley Authority in the Water Control Planning Division. With modest pride Bob acknowledges that some of their recent work saved over $60,000,000 for the city of Chattanooga alone by preventing a flood. Bob reports that his son is a senior in high school who last summer went to Germany on a student exchange basis with the American Field Service. Our special congratulations go to Bob for becoming a grandfather on March 1. Bob's daughter, Marilyn, is a senior at the University of Tennessee studying art education while her husband majors in transportation. Bob serves as secretary of the M.I.T. Club of East Tennessee.

We are indebted to Ellis Littmann for sending a clipping from the St. Louis paper reporting on the death of Frederick W. Wehmiller who passed away on March 27. The sympathy of the entire Class goes to Fred's wife and his two surviving children, Eleanor and John. Fred was president of the Barry-Wehmiller Machinery Company which he had headed since 1951.

Beau Whitton reminds us that both Lou Flanders and Don Brookfield have recently become members of the Institute's Educational Council. Beau himself has served in this capacity very effectively for many years. These men do invaluable service in fostering better relations with local secondary schools and in interviewing prospective candidates for admission. In fact, serving on the Educational Council is one of the most important ways in which Alumni contribute to the future of the Institute. Congratulations to Fletcher S. Boig who has been promoted to associate professor of chemistry at Northeastern University. Fletch received his master's degree here in chemistry with our Class.

As these notes go to press, Dick Fossett has reported on a new slate of officers for our Class. We can report that Charlie Bell has undertaken the chairmanship of the 25-Year Reunion. We will be hearing a great deal from Charlie as well as Pete du Pont in the coming year about all the plans that are in the making for a gala event in June, 1958. Your officers seek the cooperation of every member of the Class in this big effort. Word from many members of the Class indicates that we will have a large attendance. — R. M. KIMBALL, *Secretary*, Room 3-234, M.I.T., Cambridge, Mass.

1934

It will be reunion time when you read this and only two short years until our 25th. None too early for some of us to begin planning to attend. Bob McIver is an engineering test pilot for United Air Lines and during the spring took a special course at the University of Southern California in preparation for operation of United's on-order DC-8 Jetliners. No trouble about transportation in 1959 for Bob.

Hank Backenstoss has been good enough to give us a glimpse of his trip abroad in the following letter: "I was fortunate enough to be able to take a trip to France with Nicole in mid-February. When we arrived at Orly Field in Paris, I, at least, was quite surprised at the noticeably warmer climate even though we were somewhat further north than Boston. Paris wasn't exactly hot, but it was definitely topcoat weather there, whereas Boston had been in the hard grip of winter.

"Nicole's little importing venture led us to parts of Paris not usually seen by the American tourist. We visited the small manufacturing enterprises and hand-work shops which produce the fashion articles for which France is so well known. Usually found on upper floors and often in unattractive surroundings, they offer goods of amazingly fine taste and striking originality. Many establishments have been in business a long time, too. For example, there was the umbrella factory which has been operating for over 100 years.

"What will happen to some of the smaller of these enterprises in the not-too-distant future is not hard to foresee. The more marginal ones depend on low wages for their existence. The work is carried out by the housewife or by others as a means of supplementing the family income and is done at home with practically no overhead. One afternoon we looked at, and arranged for the supply of, some hand-appliquéd handkerchiefs made in the country in this fashion and then funneled through a wholesaler in Paris. We found that the wages for a 60-hour week for a woman doing this work were just about $7 — equal to what Nicky and I spent for wine and a plate of assorted shellfish at Charlot's that evening after the theater. Efforts are already underway

to raise the wage level and improve the standard of living of the French home-worker. A person familiar with the pattern that has developed in America would naturally expect this to happen, but it was confirmed to us one evening when we dined with an assistant minister of the French Labor Ministry.

"Despite this story of low wages, Paris and Parisians seem gayer, happier, and better dressed than they did two years ago. They also seem to have more money and were spending it more freely in the stores and restaurants. There was no lack of elegance at all in the salons of Christian Dior, whose spring fashion collection we were privileged to see one afternoon. A parade of 175 dresses and gowns in a two-hour period leaves one slightly breathless and is about as complete a change from engineering as one can imagine.

"The south of France was the high spot of our trip. The climate was much warmer – the topcoat disappeared except in the early morning and late evening – and carnations and Camellias were in flower. The Mimosa had passed its peak. This is delightful country in which to get off the beaten track. Of course, freedom of movement and enjoyment is greatly increased for having a built-in French vocabulary. Even so, I would suggest that the American tourist without it would find great rewards in exploring some of the French Riviera away from the coast. I say that even if he is only of the 'oui' and 'non' variety. The little medieval walled village of St. Paul, for instance, is only about 10 miles from Nice. It is gradually being restored by handcraftsmen and artisans who have taken up residence there and is an intriguing place to visit. A lunch at one of the inns there – La Colombe d'Or – is a fabulous treat. We stayed at said inn several days and developed our ruddy complexions by eating out on their terrace in the sun – and drinking wine!

"There was also La Turbie, a similar town located along the Upper Cornish on a high cliff overlooking Monaco and the Mediterranean. A trip to the Hôtel de France is worth while for its cuisine alone. The hotel itself is a very unimposing place from the exterior and not much English is spoken inside, but the food talks in all languages. It was without question the most outstanding meal we had during our entire trip. We discovered that people in the 'know' made this hotel a special port of call, and wrote accolades to the chef in its guestbook. If any '34 men or their families are in this vicinity, I unhesitatingly recommend a side trip to La Turbie. If they find the food and wine only half as good as we discovered it, it will still be worth while!"

John Hrones will leave the Institute to become vice-president for academic affairs at Case Institute of Technology in Cleveland as of July first. The position is a newly created one designed to provide increased coordination of all educational and research activities in the fields of science, engineering, and management. Dr. T. Keith Glennan, President of Case, comments as follows: "We are very fortunate in obtaining the services of Dr. Hrones, who has had long experience in engineering education as a teacher and as an administrative executive. In addition, he knows the problems of industry through his work as an engineer and as consultant." John will be much missed at M.I.T. – WALTER MCKAY, *Secretary*, Room 33-211, M.I.T., Cambridge, Mass.

1936

Most of the news reported is either old or very old. For a change we are passing along something that arrived in the last mail. The Ben Coopersteins are the proud parents of another child. It's a boy – Hugh Gordon Cooperstein. March 24 was the official date and he weighed in at seven pounds and ten ounces. Congratulations, Mother and Dad. Ben, we will arrange to have an up-to-date mailing list of the entire Class put at your disposal so that you may be sure each classmate gets one of your dollar cigars. You can send me two as I have won the bet we made at the Class reunion. I have lost the 20 pounds and am down to 175 now. Are you still at 195? For those of you who have not seen Ben since 1936 when he weighed about 135 (including loaded brown bag), he carries his extra pounds very well. As someone remarked when we were leaving the Ocean House in Swampscott headed for school on Alumni Day, "His figure compliments very well that new low and long, long, long Cadillac of his."

Also in the latest news department, a three-penny post card announced the following *great news*. Look who's moving to California! Henry F. Lippitt, 2d (alias Square Deal Hank). New address after April 15: Southern California Gas Company, 810 South Flower Street, Los Angeles 17, Calif. Phone Michigan 0171. I wish there was some easy way to get this news to his creditors other than through The Review with its two-month lag factor. There is one consolation – you can always call him collect and run up a bill. Seriously, brother '36ers, we are deeply indebted to Hank for all the many fine things he has done for the Class. We in the New York area will miss him a great deal and will all have to dig in and work a little harder to make up for the loss of his great organizing ability. Hank has given freely of his time to activities in this area for many years. Thanks for everything, Hank – our loss is California's gain. Try to continue to scoop the news for the notes as always.

One Sunday evening not long ago, while at Idlewhile Airport waiting for a plane to San Francisco, I met Colonel Bagnulo (Al, to all '36ers). He was waiting to take off for Europe where he was to check into the cement shortage that one of the projects was facing. As reported in February, he is district engineer of the Eastern Ocean District with headquarters in New York. His responsibility extends over one-quarter of the free world. Al has some interesting news to tell us if he ever gets time enough to sit down and put it on paper. Meanwhile, I will brief you with a few facts picked up from an article in a Boston newspaper.

Al was responsible for construction of the United State rocket launching site at Fort Churchill, Manitoba, Canada, completed last November by the Corps of Engineers. He was a member of the team that developed typhoon-proof buildings on Okinawa. He supervised a highly secret experimental project at Martha's Vineyard in 1943 to determine the feasibility of laying fuel pipelines under the English Channel. He proved it feasible, and the Allies did just that. Al's Army career began in 1937 with a commission in the Corps of Engineers. Army engineering is rigorous. In a single day Al might consider the short construction season on Baffin Island, the labor market in the Azores, the frost in Labrador, and the political climate in Iceland. His travels take him to all these places, and in the course of a week he may wear heavy boots and fur-lined parka at one place, Bermuda shorts at another. A proud father with four sons in Teaneck, N.J., Al dislikes the long hours away from his family. His wife is the former Helen Montesinos, daughter of a retired Army colonel. Helen, like other Army wives, has endured many long separations. Al not only served in Europe in World War II as commander of an engineering construction regiment, but also in the Pacific. A full colonel at the age of 30, Al had to relinquish the rank in the Army-wide reduction in grade at the end of the war. He was repromoted to colonel in 1951.

In the April Class notes we reported that Gerard Chapman had won second prize ($750) in the Bolton Award Contest. Essay title: "Here's What I Want from My Job." Apparently we should all read the essay and then write one ourselves. Jerry is no longer technical director of the Walloomsac Division of Columbia Box Board Mills, Inc. He is now paper technologist in the research laboratory of the Smith Paper Mills. The announcement was made by Peter J. Schweitzer, Inc. After leaving Tech, Jerry spent a year in the consulting laboratory of Skinner and Sherman, Inc., at Boston, four years at the Portland Cement Association Research Laboratories in Chicago, and four years in the Development Department of the Wood Conversion Company in Cloquet, Minn. Following the death of his father, he was owner and operator for nine years of a fiction syndicate which he inherited. During this time Jerry and his wife, Alice, moved to Great Barrington, Mass. The Chapmans have four children.

Beau Whitton sent in the following on Ed Cahill. The Reverend Edward A. Cahill, former pastor of Charlotte Unitarian Church, will be installed as minister of the United Liberal Church of Atlanta, Ga. Mr. Cahill was minister of the Charlotte congregation for several years before he resigned to assume duties in Atlanta. An active participant in community affairs he was also a frequent lecturer abroad and throughout this country. After leaving Tech, Ed attended Tufts and Tufts' School of Religion. Prior to his pastorate in Charlotte, he served in Clinton, and Chelmsford, Mass., and Nashua, N.H. During the war he served as associate director for the Unitarian Service Committee, a non-sectarian international relief organization.

Frank Parker writes the following: "I find that I live in the town where I grew up, I married a girl I had known most of my life, and we have four children. I have worked continuously for the same com-

pany (except a few years in the early forties) doing substantially the kind of work for which I prepared at Tech. It appears that my only claim to newsworthiness may rest with my undeviating deviation from the migratory norm. I must confess that I enjoy it."

Hermann Friedlaender is project engineer for Food Machinery and Chemical Corporation of San Jose, Calif. Herm is in the company's Ordnance Division, principally designing and building full-tracked amphibious vehicles for various purposes. Eldon Dunlap is division petroleum engineer, The California Company, Western Division, Denver, Colo. Ed Hoffman is engineer in charge of the Relay Branch of the Electrical Engineering Division of the Philadelphia Electric Company. Ed, his wife, and their ten-year-old daughter live in Wynnewood, Pa., just outside Philadelphia. Phil Slater is assistant actuary for the Equitable Life Assurance Society specializing in pension work. Phil also does some consulting work on retirement plans. The Slaters have two daughters. George Trimble is, among many other things, making moons. George writes, "Anyone in the Class that needs a moon should write me at once. Have not yet figured out how to make a profit at this." Since George has switched from planes to a 35-foot Cris Craft, I am sure he has figured out a way to make a profit.

Some '36er sent in the following information: "Am currently a staff engineer for the director of the U. S. Geological Survey in Washington, D.C., Room 5229, G.S.A. Building. Home address is 4603 Woodfield Road, Bethesda, Md." If anyone can identify him from the above, please write in so we may clear up this mystery. Dave Varner is a patent lawyer in Washington. He is a partner in the firm of Cushman, Darby and Cushman. Dave is busy suing and being sued. The Varners have two children and live at 730 15th Street, N.W., Washington, D.C.

The Reverend John S. O'Conor writes, "For the last 13 years I have been chairman of the Department of Physics at St. Joseph's College, Philadelphia, and in 1951 instituted a course in cooperative electronic physics, similar to Course VI-A at M.I.T. Since that time enrollment of freshman physics majors has grown from approximately 15 a year to 75 a year. Eight companies (or agencies) are participating in the plan." Henry Furniss is in the life insurance business in Atlanta. The Furnisses have two boys; 18 and 15 years old. Bill Tier goes Hank one better; he has three boys — seven, six, and two and a half. Bill has been with Philadelphia Tramrail Company since 1936 except for Naval service in Detroit from 1942 through 1945. Bill Bode writes, "General manager of the Selig Company, Atlanta, Ga. One wife, two daughters, one great Dane, one boxer, no money in the bank." — JIM LEARY, *Secretary*, One Putnam Park, Greenwich, Conn.

1937

If the Reunion isn't over when you read this, you may have time to drop everything and get up to The Belmont, West Harwich, Mass. The program is a wonderful one with a jam-packed schedule of entertainment, banquets, dances, and just plain fun and fellowship for all. A last-minute offer by Mrs. Martin Kuban, II, to treat us to some wonderful songs and harp music has just come in. Looks as though we will have well over 150 there, so let's go.

Martin's letter is very interesting: "Each year for the last 15 years I resolved to write a letter to you for The Review, but for one reason or another I kept putting it off until another time, until this procrastination became a bad habit. But with the 20th Reunion coming up, the old school spirit welled up within me to such a point that I could no longer put off this writing.

"Looking back the 20 years, the amazing thing is that I find myself a confirmed Midwesterner; because upon graduation I had not the least idea or desire to leave the East and had passed up several choice positions offered in the Midwest. But now, here I am; have been here now 17 years. It all started when I took on a sales engineering job at Baush Machine Tool Company in Springfield, Mass., as an inside man. Two years later Baush sent me out to Detroit to help in the tooling-up of war industries. That was in 1941. For the duration my activity was centered around Detroit and Chicago representing Baush. After the war ended I had become so acclimated to the Midwest that when I severed connections with Baush, I stayed on in the Midwest.

"But I guess it was my fortune to settle in the Midwest, otherwise I never would have met my 'ideal,' and probably would have remained a bachelor. It was through my musical endeavors that I met Lorrayne, a lovely blonde music teacher at Winnetka, Ill., public schools. During our courtship we sure made sweet music together! And we're still making music, although separately. Lorrayne does it professionally by directing a large church choir (100 voices), teaching voice, and giving frequent vocal concerts (in the Midwest area) with her own harp accompaniment. She specializes in folk songs, ballads, and religious songs. Last year she toured Europe giving voice-harp concerts. Music still is a hobby with me. I have organized (a few years ago) a chamber music ensemble consisting of recorders, strings, and harp or harpsichord. We do serious music, but Spike Jones has nothing on us. Our ensemble has even made some TV appearances!

"In 1946 Lorrayne and I moved from Chicago to Milwaukee and I went to work as sales engineer for the Socony Vacuum Oil Company, industrial division. The oil game became quite rough, and after a couple of years of that I had had enough and decided to go into the machine design field which was my major at Tech. So in 1948 I joined the A. O. Smith Corporation and occupied a drafting board in their special machinery division as a senior designer until 1951. At that time I secured my registration as a professional engineer in Wisconsin and decided to set myself up in private practice to do consulting work and designing of automatic machinery. I'm still in this business operating under the name of Automation Engineering Service, 7343 Milwaukee Avenue, Wauwotosa 3, Wis. Since 1949 we have been living in Wauwatosa, a charming old suburb of Milwaukee, where we bought one of those old, large homes with lots of rooms for our children and all our extra activity. Our son, Christopher, is now going on ten, and our daughter, Carolyn, is eight and one-half. We just observed our 12th anniversary. Well 'nuff said about ourselves. I haven't seen much of any of our '37 gang. There is only one other '37 grad in Milwaukee and he is Jonathan Cobb, Course V. He is a chemist at Pittsburg Plate Glass Company, paint division in Milwaukee. We see each other occasionally at some of our M.I.T. Alumni functions. So you see, our Class is spread out pretty thin.

"It certainly should be fun to see the gang again and to roam the halls of Tech. I wonder if we'll recognize each other after 20 years? I, for one, have changed — I'm not wearing a moustache any more. Girthwise, I'm only four inches more in circumference than back in '37. By the way, we are planning on taking along Lorrayne's small Irish Harp because she has booked some engagements in New York. So if there would be need for additional entertainment at our Reunion, she has offered to provide from one-half hour to three-quarters of an hour of unusually interesting vocal songs with harp accompaniment at no charge. She would do folk songs and ballads, some familiar and some out of the ordinary, from many lands — British Isles, Germany, Scandinavia, America, etc. She is very entertaining, her songs are done beautifully, and her staging is striking in gold costume with golden spotlight. If you feel there would be interest in Lorrayne's offer on the part of the Reunion Committee, have them write to her for more details. Enclosing her photo. Let's hope all goes well with the plans for the big affair, and that the weatherman plays fairly with us. Our best regards to you and the committee. Martin M. Kuban, II, '37."

Dave Fulton is back in New York after two and one-half years in Montreal as vice-president of Lummus, Canada. Dave is in charge of all international sales for the Lummus Company. He says, "If nothing else, I have been a damn good customer of the airlines. Hope our 20th will be a resounding success — sounds terrific so far. Good luck to you and the rest of the committee, and we'll see you in June." Art Zimmerman has been elected vice-president in charge of sales of The Steel Improvement and Forge Company in Cleveland, Ohio. Art has been with the company for 10 years, and I speak from personal observation (having been on a plant tour) — they are progressive, aggressive, and a fine group of people.

Bertrand E. Bennison is another of our classmates who went on to school after graduation to become a medical doctor. He was recently named assistant director of the medical research division of Esso Research and Engineering Company, Linden, N.J. He joined Esso Research in 1954 as chief clinical research physician after over 12 years with the Public Health Service. George Ewald is now manager of the textile division, Industrial Sales Department, of the Celanese Corporation of America. He is living in Carmel Park, Charlotte, N.C., along with the rest of his

fine family. — WINTHROP A. JOHNS, *Secretary,* 766 Hyslip Avenue, Westfield, N.J.

1938

Our news this month consists of a few brief items. The first on the list tells us that Wilder Moffatt, who was formerly chief industrial engineer of the Fairchild Camera and Instrument Corporation, has joined the staff of Wallace Clark and Company Inc., Management Consulting Engineers. Earlier he served as naval architect at the Panama Canal for the supervisor of shipbuilding at Newport News, and was design superintendent at the Norfolk Naval Shipyard. For 10 years he was projects engineer and chief industrial engineer with Bonney Forge and Tool Works.

Bill Whitmore writes that he is "now chief scientist, Special Projects Office, Bureau of Ordnance. This office, under A. D. M. Raborn, is developing the *Polaris* Ballistic Missile." Earlier in the year, we find, Mert Barrows was a candidate for the regional district school committee that includes Boxford, Mass. We haven't heard how the election turned out. He has been associated as an architect with the firm of Royal Barry Wills since 1936. He was assistant architect on Federal Public Housing in Boston.

Al Wilson, who is president of the A. O. Wilson Structural Company, Cambridge, has been elected a director of the Reliance Cooperative Bank, Cambridge. Al has a number of other activities which include the responsibility of being treasurer of the Massachusetts Council of Churches. He is a trustee of the Andover Newton Theological School, a director of the Boston City Missionary Society, vice-chairman of the Cambridge Salvation Army campaign, and New England chairman of the American Leprosy Mission.

Another school committee candidate was Dick Young of Mattapoisett, Mass. He is also active in community affairs. His town activities have included service on the Centennial Committee, Welcome-Home Day Committee, Mattapoisett Housing Authority, Soap Box Derby, harbor protection, Zoning Bylaws Committee, Mattapoisett Improvement Association, and Mattapoisett Taxpayers Association.

Finally, from Providence, we hear that H. Bruce Leslie was elected assistant vice-president of Firemen's Mutual Insurance Company. He is president of the M.I.T. Club of Rhode Island, and has been with Firemen's since 1941. — D. E. ACKER, *Secretary,* Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

1939

I was pleasantly surprised the other day to receive a phone call from Leonard Jaffee who, as president of a local American Institute of Mechanical Engineers group, phoned to ask why I hadn't been attending meetings. After we straightened all that away, Leonard told me he was at the California Institute of Technology in the jet propulsion business, and on the home front was living happily in the San Fernando Valley with wife and four children. Tom Creamer'40 made news recently with a speech before the A.I.M.E. in Denver. There was a nice picture and write-up in the recent *Engineering and Mining Journal.*

Top of my list this time, though, is William H. Phillips, 310 Manteo Avenue, Hampton, Va., who wrote, and I quote: "I enjoy reading your Class notes. I guess your job would be simplified if you got more cooperation from the classmates. Unfortunately, I don't have any very startling news to report. Maybe a few contributions such as this would serve to get other more notable news rolling in. I have worked for the National Advisory Committee for Aeronautics (NACA) since leaving M.I.T., after staying an extra year. I am at the lab at Langley Field, Va. Several other of my Course XVI classmates have worked here also. These include Art Vogeley, Norris Dow, Dick Sears, and Bill Gray. Of these, Sears and Dow have been attracted to the greener pastures of industry during the past year or so. Sears is at Raytheon in Boston and Dow is at General Electric in Philadelphia. Wes Kuhrt is at United Aircraft, Hartford, and Walt Kykytow is in charge of flutter work at Wright Field. I occasionally see Orville Dunn of Douglas, and Withington of Boeing. I suspect Jim Barton is still there also, but would be interested to know definitely." Jim, may I suggest you write Bill directly and tell him you are still at Boeing. While you are with pen in hand, how about dropping me a note to include in a future edition of Class notes?

He continues: "Remember me to Bob Fife. He was a classmate of mine in junior high school, though I must admit I never saw much of him at M.I.T. It's nice to know he is doing well. Another friend of mine, Herbert K. Weiss, lives somewhere near you (3329 Via La Selva, Palos Verdes Estates, Calif.). He graduated slightly before us, though he went through so fast it is hard to tell what class he was in. He is in charge of Operations Analysis at Northrop. I knew him in Boston primarily because we both built model airplanes. My interests are still along these lines. I am head of the Stability and Control Branch, Flight Research Division at N.A.C.A. In my spare time I work on radio-controlled models — that is, when not occupied with the three children; Freddie, eight, Bobby, five, and Alice, one and one-half."

Well, if you enjoyed reading about the others, you can bet they'll enjoy reading about you. So, while the thought is fresh in your mind, why not sit down, just like Bill did, and drop me a few lines. — HAL SEYKOTA, *Assistant Secretary,* 416 Calle Mayor, Redondo Beach, Calif.

1940

Charles Booth, who has been Admiral Stump's assistant chief of staff for operations since June, 1955, has been assigned the command of the U.S.S. *Ranger,* one of the Navy's newest giant aircraft carriers which will be commissioned in July.

Harold Graham has recently founded Paket Corporation, 9022 S. Baltimore Avenue, Chicago, Ill., which is a new packaging business. Paket does contract packaging services and operates automatic machinery for packaging all sorts of products. They specialize in filling powders, liquids, and pastes in all sizes and styles of tubes, boxes, jars, bottles, and containers. Previously, Harold had been vice-president of Illinois Baking Corporation of Chicago. Good Luck, Harold, in your latest venture. — ALVIN GUTTAG, *Secretary,* Cushman, Darby and Cushman, American Security Building, Washington 5, D.C. SAMUEL A. GOLDBLITH, *Assistant Secretary,* Department of Food Technology, M.I.T., Cambridge 39, Mass. MARSHALL D. MCCUEN, *Assistant Secretary,* 4968 West 14th Street, Indianapolis, Ind.

1941

Flash! Social notes continued (fatal weakening of the bachelors' stronghold). After good-naturedly enduring many long months of jibes, taunts, wisecracks, and worse from the old (?) married men, Prexy Ed Marden finally yielded to superior forces. He and Miss Natalie Peinstein of Worcester were married on March 12. Our very best wishes to the newlyweds. On March 31, a party was held in their honor, and Dot and Irv Stein and I were fortunate in being able to attend. We are pleased to report that, as would be expected, the bride is a very charming young lady, and an asset to the Class as well as to Ed.

A most welcome letter from Frank Storm, on a letterhead marked "Storm, Hagy, and Herrmann — Petroleum Production — Amarillo, Texas," tells us, "We have been quite busy and have been actively working at building up a production company. It's really quite a gamble and keeps you on the edge of your seat. So far we have drilled for gas only, but I think that sooner or later we will have to get into oil." We hope it's a gusher, Frank. Also had a nice letter from Joe Myers, who modestly neglected to mention that he had been recently promoted to general superintendent of the Riverdale Plant of the Acme Steel Company in Chicago. The press release goes on to say, "Myers joined Acme Steel in 1946 as a production engineer. He became engineering projects coordinator in 1947, and was appointed assistant superintendent of the Manufacturing and Processing Division in 1949. After serving as superintendent of the same division from 1950 to 1954, he was appointed assistant general superintendent, which position he held to the present. He graduated from M.I.T., and later from the University of Chicago with a master of business administration degree. Myers is vice-president and a director of the Executive Program Club of the University of Chicago; he is a member of the Economic Club of Chicago and the Association of Iron and Steel Engineers; and he is active as a troop committeeman in the Boy Scouts, and has participated in Red Cross and Community Fund activities. He lives in Hinsdale."

A release from the Arnold Engineering Development Center, Air Research and Development Command, U. S. Air Force, in Tullahoma, Tenn., brings us the news that Rudy Hensel has been appointed chief of the Propulsion Wind Tunnel. The story continues, "He graduated from

M.I.T. and in 1944 was awarded a master of science degree in aeronautical engineering from the California Institute of Technology. During the war, he served as engineer-in-charge of the ten-foot wind tunnel at Wright Field, Dayton, Ohio, advancing to the rank of major before his release from active duty in 1947. He then spent six years as chief of the Data Analysis Section at the Southern California Cooperative Wind Tunnel at Cal Tech. He came to the A.E.D.C. in August, 1953, and was manager of the Transonic Branch of the Propulsion Wind Tunnel until his appointment as assistant chief of the facility in February, 1956. Mr. Hensel, his wife, and family live in Tullahoma."

From the Crucible Steel Company of America comes the word that Gene March has been promoted to assistant manager of the company's Sanderson-Halcomb Works at Syracuse, N.Y. Their release reads, "Mr. March joined Crucible in 1946 as metallurgist – mill control. He became foreman of the rolling mill in 1948, and in 1950, metallurgist – melting department. Two years later he was named general supervisor of metallurgical control, and in 1953 was appointed chief metallurgist, the position he held until the present."

From the *Sperry Engineering Review* comes the following: "Robert S. Edwards has been promoted to the new position of engineering manager – Hustler, reporting to the engineering director for air armament. In his new position he will be responsible for the direction of several departments concerned with development of the bombing-navigation and missile guidance systems for the Hustler (B-58) program. Edwards joined Sperry as an assistant project engineer in 1942, assigned to servomechanism work on tracking systems. In 1944, he was transferred to the Fire Control Engineering Department, and became a project engineer while engaged in design work on a bombing-navigational computer. He was promoted to senior project engineer in 1946, and in 1947 was transferred to MacArthur Airport for flight tests of the prototype bombing-navigational computer. He was promoted to research engineer in 1948, and then to engineering section head for Point Mugu Laboratory, where he carried out missile field test work. He returned to the Nassau plant in 1953, as head of the Missile Components Engineering Department, and in 1954 was transferred to head of the Navigation and Guidance Systems Engineering Department."

Nuclear Metals, Inc., of Cambridge, has named J. Lester Klein assistant technical director. He has been with the company since it was formed in 1954, and had most recently been director of the Physical Metallurgy Department. He had previously been with the Crucible Steel Company at Harrison, N.J., where he was assistant chief research metallurgist, and with Jessop Steel Company at Washington, Pa., as director of research. And finally, Donald McDonald has been named director of engineering of the Friez Instrument Division, Bendix Aviation Corporation, with headquarters in Baltimore. He was formerly assistant director and chief engineer of Cook Research Laboratories, Skokie, Ill. He holds more than 20 patents on electronic components and systems.

Men, it's a real pleasure to report on your progress; the best of luck to all of you in your new positions. And, to others who have not been mentioned, don't hide your light under a bushel; send me releases, clippings, or, better still, your own story. We're all interested in how you're doing. – IVOR W. COLLINS, *Secretary*, 28 Sherman Road, Wakefield, Mass. HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

1942

Ron Shainin is on a safari again. We feel it most appropriate to quote his letter and the accompanying full column newspaper story in their entirety: "Many thanks for your letter of March 18 asking me to take my African film along with me to the 15th reunion. I would be pleased to do so if it weren't for the fact that in June I will be in British Central Africa once again. The enclosed clipping will fill you in on the details of the forthcoming trip. Please give my very warmest regards to all the men of the Class of '42, and also to all the lovely wives they have managed to accumulate along the way. (I'm still a bachelor for religious reasons. I'm a devout coward.) I hope I will see you all at the 20th reunion. Most sincerely, Ron."

The story in the Buffalo *Courier Express* is as follows: *"Local Man Will Hunt Lions, Snakes in Africa:* An Eggertsville man will leave New York in May headed for a year and a half in Central Africa to hunt lions and bring back alive some of the continent's more deadly snakes. Ronald E. Shainin, 35, of 430 Windermere Boulevard, will leave his job as manager of the Contract Administration Department of Bell Aircraft's research division to undertake the safari. Accompanying him will be James Fowler of Ocala, Fla., an ecologist and falconry expert. This will be Shainin's second trip to Africa. In 1953 he and a fellow Buffalonian, John Chisholm, spent 15 weeks lion hunting in Northern Rhodesia during which they eliminated four cattle-killing lions, and a lioness all but eliminated Chisholm. The latter had a very narrow escape when he was severely bitten in the leg by a wounded lioness.

"Shainin and Fowler will board a freighter at New York on May 10, taking a heavy-duty truck with them with which they hope to traverse 30,000 miles of thorn bush, rain forests, scrub, and savannah lands. They will begin the tour of the continent with a trip through a sketchily mapped section of southeastern Portuguese West Africa noted for its abundance of game. This will be followed by a lion-hunting session in a portion of Central Africa where they have been granted permission to hunt by a native chieftain. It is here that they hope to find specimens of the Egyptian Cobra for the American Museum of Natural History in New York. It is suspected that this may be a hitherto unknown subspecies of that reptile. They also hope to secure specimens of the eight-foot long, black-necked spitting cobra, one of Africa's most venomous specimens. This creature spits venom accurately for distances up to six feet, causing a stinging sensation in its victim's eyes. American zoos prize this specimen highly.

"In addition to the cobra and other venomous snakes, they hope to obtain five live specimens each of lions and hyenas for the Baltimore Zoo. Fowler, being a falconer, will attempt to capture several species of African eagles having wingspread somewhat over seven feet. These will be sent to Birds of Prey, Inc., at Ocala where he is employed as lecturer. After Central Africa they hope to head north to the great Serengeti Plain where they will spend a month photographing the huge game herds inhabiting this corner of Tanganyika. Eventually, they expect to shoot some 40,000 feet of color movie film of game.

"The Ngorongoro Crater, an extinct volcano 8,000 feet high which houses a gem-like lake within its mouth, will occupy another month of their trip. Following Fowler's return to the United States in May, 1958, Shainin will continue on through the Ituri Forest, then return home with his specimens."

Dr. Franklin Hutchinson is in the news with the lecture he gave recently on "The Biological Effects of Nuclear Radiations." Frank is assistant professor of biophysics at Yale. Under a grant from the Childs Fund, he has conducted studies relating to the radiation dosage of X-ray treatment. He has done research on small-angle scattering from viruses under a National Science Foundation grant, and, with support of the Atomic Energy Commission and the American Cancer Society, has done research on the fundamental action of ionizing radiation.

An announcement from Bernard Levere tells of his formation of the Macbern Construction Corporation with offices at 246 Fifth Avenue, New York City. Bernie and his associates are builders and general contractors. On exhibition at the George Walter Vincent Smith Art Museum in Springfield, Mass., were some pottery pieces made by Harry Remde. The exhibition was entitled "Today's Interiors No. 2" and featured contemporary ceramics, rugs, furniture, and paintings. Professionally, Harry is a ceramic physicist. His wife, Gladys, also exhibited pottery.

Arthur Solomon was recently elected secretary-treasurer of the Souther Engineering Company of Hartford, Conn. Richard Fay has returned to New England as U.S. Weather Bureau research coordinator at Woods Hole Oceanographic Institute and New Bedford. He will be primarily concerned with basic research and with hurricane analysis and forecasting. Mr. Fay took his B.S. in biology at Harvard before coming to Tech as a special student with our Class. He was a meteorologist with the Air Force for four years, two of which were as staff weather officer in the Newfoundland Base Command. Following the Air Force tour of duty, Richard spent two years at Shannon Airport, Ireland, with the American Overseas Airlines, and then returned to the Air Force as a civilian meteorologist for eight years. He is married and has two children. His wife is a native of Newfoundland whose family originally came from Truro, Mass.

Further correspondence with Fred Gander yielded some interesting information about the Yerkes Research Laboratory of which he was recently appointed director. The group of over 80 scientists and technicians is responsible for the Du Pont Film Department research. From their talents and training in polyester chemistry, polymerization catalysis, nuclear magnetic resonance, chemical engineering, and many other fields have come startling new developments such as "Mylar" polyester film.

My file yields Charlie Speas' annual Class Agent letter and a few statistics on how we as a class have been doing. It doesn't look so good. Percentagewise we are typical of our neighboring classes at the 25 percent level, but dollarwise at $17.50 for an average contribution we are much below the Classes of '40, '41, and '43. Let's be sure we are doing our part by raising the ante and then checking with our classmates to get wider participation. Every dollar counts towards freshman scholarships, faculty salaries, and providing facilities in this period of new developments and greater demands for engineering personnel.

Catching up with the Alumni Register we find that: William R. Franklin is now Captain, U.S. Navy, with the address Staff CINCNELM Navy H 100, c/o FPO, New York, N.Y.; Henry J. Zimmerman of Swampscott, Mass., is now a professor; Monroe S. Sadler has his Sc.D.; Stephen E. Woodbury, Jr., has had his affiliation officially changed to join us; Sidney S. Hanley left New York for Zurich, Switzerland, and is with Chemical and Industrial International, Ltd.; Duncan C. Purcell went from Poughkeepsie to Frankfurt-am-Main, Germany; Clarence J. Grogan moved from Fairbanks, Alaska, to Swampscott, Mass.; Dr. George A. Thompson, Jr., only crossed the country from Palo Alto, Calif., to Nyack, N.Y.; Daniel R. McNeal, Jr., went as far the other way from Jenkintown, Pa., to Santa Ana, Calif.; Stephen G. Sydoriak went from Cambridge, Mass., to Los Alamos.

Those moving less than 2,000 miles include Henry N. Titzler to Portuguese Bend, Calif.; Harry P. Wood to Washingtonville, N.Y.; Edward W. Smith, Jr., to Stamford, Conn.; Robert P. Boyer to Manchester, Tenn.; Robert Wilson, Jr., to Miamisburg, Ohio; Richard P. Stout to Lake City, Pa.; Captain William N. Richardson to Hq 11th Trans Term Comd B, APO 21, N.Y.; Lieutenant Charles D. McCarty to Hq 2nd Weather Wing, MATS, APO 208, N.Y.; Donald H. Kern to Falls Church, Va.; George H. Hart to Newcastle, Maine; Robert C. Gentry to West Palm Beach, Fla.; Major Richard W. Bloomingdale to Hq 1st Weather Wing, APO 925, San Francisco, Calif.; Charles Strohmeyer, Jr., to Reading, Pa.; George W. Richardson to Corning, N.Y.; Edgar O. Parker, Jr., to Billerica, Mass.; Henry Lemaire to Leonia, N.J.; Ralph W. Garrett, Jr., to Humble Oil and Refining Company, New Orleans, La.; Captain Harry E. Davis, Jr., to USCG Hq in Washington, D.C.

Frederic Shackley has moved to Westminster, Colo.; Calvin S. Morser to Wellesley, Mass.; Robert M. Curtis to Westport, Conn.; John D. Berwick to Baltimore, Md.; Albert E. Hayes, Jr., to St. Paul, Minn.; Gordon B. Dunnington to Wilmington, Del.; Charles O. Dodson, Jr., to Lewiston, N.Y.; Professor Forbes S. Robertson to Bellevue, Wash.; Casimir T. Wittl to Tallmadge, Ohio; Baker B. Williams to Oklahoma City, Okla.; Donald H. Stansfield to Trenton, N.J.; Daniel Robbins to Albuquerque, N.M.; and Major Frederick M. King to Alamogordo, N.M.

Best wishes for an early start on the garden, golf course, boat painting, and tennis court. — Lou Rosenblum, *Secretary*, Photon, Inc., 58 Charles Street, Cambridge 41, Mass.

1943

A happy announcement this month is the engagement of Marjorie Jane Eustis to Ray Frankel, both of New York City. Miss Eustis is a graduate of the University of Minnesota and received her master's degree from the New York School of Social Work, Columbia University. She is an instructor in the Division of Pediatrics, Pediatric Psychiatry Department, New York State University College of Medicine, and is also affiliated with the Lenox Hill Hospital. Ray is with Electric Bond and Share Company, the New York investment concern, and is a director of the Applied Science Corporation of Princeton and of Pantheon Books, Inc. He was formerly general manager of *The Reporter* magazine and was associated with J. H. Whitney and Company.

More promotions to report: Al Burrill was appointed sales manager of High Voltage Engineering Corporation, Cambridge, Mass.; Bernard Reckseit has been made chief engineer of Ransohoff, Inc., in Hamilton, Ohio.

Change of address notices show that Warren Foster moved from Connecticut to Ft. Lauderdale, Fla.; Jacques Maroni from Massachusetts to Dearborn, Mich.; and Bill Post from Pennsylvania to Bogotá, Colombia. Class President Jim Hoey's letter of April 1 extended a warm welcoming hand to all for the reunion at Tech on June 10. I look forward to seeing you there. — Richard M. Feingold, *Secretary*, 49 Pearl Street, Hartford 3, Conn.

1945

As you all know, the reporting of your Class secretary is similar to a two-way street; not only must your secretary have a desire to write, but also he needs something to write about. The Class mail has been a vacuum these many months. Why don't you drop me a postcard while you are on your vacation tour this summer (the 19th hole would do!).

I think you will all agree that Reg Stoops jumped the vacation gun when I relate the following story. It was a great surprise to read in the Stamford paper one Monday evening in early March that Reg Stoops and a companion swam three-quarters of a mile to Cove Island, Stamford, late Sunday afternoon, after a 10-foot dinghy overturned, dumping both into the water. Cold and exhausted the boys broke into a house (and its liquor closet) to call for help. After a warming period at the local hospital the boys were released. I saw Reg that Monday evening; he modestly says that they only swam three-eighths of a mile fully clothed. It seems that the boys were retrieving duck decoys (out of season, too!) when the line tied to a mushroom anchor let go and over the side it was. I am pleased to say that Reg is none the worse for wear; in fact, he would be pleased to help you with your plastic problems — on a consulting basis of course!

John C. Dunbar, Vice-president of the Thomas Hill School Parent-Teachers' Association, was the Association's featured speaker early last winter. John, father of five, and jet plane test pilot at M.I.T.'s experimental laboratory at Hanscom Air Force Base, Bedford, showed a film on jet plane progress. Edward R. Fryer, co-contributor of "Evolution of a Twin Engine, Four-Wheel Drive, Earth-Moving Carry-Scraper" in the March 1957 issue of the *General Motors Engineering Journal*, is a senior project engineer at Euclid Division. In this capacity he has supervision of carry-scraper and overhung engine tractor design. Ed has been with Euclid since 1947 and assumed his present position in 1954; he is quite active in the Society of Automotive Engineers.

As we have no further news items, possibly a review of the address changes might lend a story or two. Frank Bossler is still in Tonawanda, N.Y., after eight years. Dave and Peggy Clare have just bought a new home on Knollwood Terrace in Westfield, N.J.; Dave is still with Johnson and Johnson in New Brunswick. I tried to get Bill Colman to help in the Stamford area local Fund drive, but I can't remember what he is doing. John Gaffney must still be with International Business Machines as he has been in Endicott, N.Y., for about 10 years now. Clarence "Red" Howell has been in Mercer Island, Wash., since 1951, but I do not know of his livelihood. Commander Miles Libbey is now at Long Beach after three years in the Marianas. Dr. Jim Shearer has been moving in and about Boston, but he is still with Tracerlab. Both Larry Van Ingen and Charlie Johnson are with Socony Vacuum's Refinery Engineering Division. Elaine Bickford Bart is now in Westport, Conn., after five years in Lakeland, Fla.

After 10 years at Ingalls Shipbuilding Corporation down in Mississippi, John Howkins has relocated in Rye, N.H.; I suspect he is working at the Portsmouth Navy Yard in Kittery, Maine, but that's just a guess on my part. Harry Eisenhardt is still in California now in Canoga Lake. I often wonder what has happened to Harry's old side-kick, Dick Luce. A recent address change still has Don Walsh in Houston, Texas; the last I knew Don was with the Insulated Wire Division of U. S. Rubber which was just bought by Kaiser Aluminum Company. Lieutenant Commander Roman Brooks is stationed at Supships, New York Shipbuilding Corporation in Camden, N.J., after a tour at Bureau of Ships in Washington, while Commander Lyle Ramsey has moved from Virginia Beach to Beech Croft Road in Greenwich, Conn. The Placement Bureau has Bob Hibbard in Ridgway, Pa., after three years or so at Joclin Manufacturing outside of New Haven, Conn. Kirk

Drumheller, the Walla Walla kid, is now in Richland, Wash. Lieutenant Commander Max Eaton is at the Institute of Meteorology in Stockholm, Sweden, while Commander Arthur Pfeiffer is halfway around the world in Honolulu. Thornton Smith, with Kuhn, Smith and Harris, Inc., builders in New York, has just affiliated with our Class from 10-44. Jim Pickel must be with Du Pont as his most recent change of address still has him in Wilmington. Guy Gilland, an executive assistant at St. Regis Paper, has relocated in Scarsdale, N.Y.; his address is 108 Clarence Road. From what I can gather, John Hertig really has made a change; after a lifetime in New Jersey he has relocated in Ayden, N.C. Arthur LaCroix still bounces about New England while Hal Rover remains in Middletown, N.H. Dr. Davis Mintzer is now in New Haven after several years at General Wire in Providence.

If we don't see you in July have a wonderful summer. Don't forget that postcard, and we'll see you in early fall. — C. H. SPRINGER, *Secretary*, 420 Lexington Avenue, New York, N.Y.

1946

I have just received a letter from Herb Hansell informing me that the Class President's letter, due out this spring, will contain another questionnaire with a request that it be filled out and returned to me. I should like to again thank all those who returned the questionnaire last fall, and to request that those who didn't respond last fall please do so with this new opportunity. Your news will make interesting reading in these columns next year. And don't let me discourage anyone who did respond last fall if they have had a job change, family addition, or any other interesting change. We'd all like to hear about it.

Howard F. Taylor, who holds a B.S. in chemical engineering and an M.S. in metallurgical engineering, both from Michigan State College, was a graduate student associated with our Class. He was an associate professor of mechanical metallurgy at M.I.T., until 1952 at which time he became a full professor. Howard was awarded the American Foundrymen's Society's Simpson Medal in 1945, and also is the holder of a Joint Army-Navy Distinguished Civilian Service Award. In addition to co-authoring a textbook, *Metallurgy for Engineers*, John Wiley and Sons, 1952, he is the author or co-author of close to 100 technical papers published in various metallurgical journals. He is a member of the American Foundrymen's Society, the Institute of British Foundrymen, the American Society for Engineering Education, the American Society for Metals, the American Institute of Metallurgical Engineers, and is a professional engineer in the State of Massachusetts. (So you thought *you'd* been busy, eh?) The Taylors and their three sons live at 346 Marsh Street, Belmont, Mass.

Martin C. Parks is plant superintendent for the Texas Aluminum Company, a firm making aluminum extrusions for the aircraft, architectural, truck, trailer, and residential construction industries. The Parks live at 1018 Ridge Road, Rockwall, Texas, and Martin is director of the Lions Club and is a deacon of the Rockwall Presbyterian Church. William F. Scheller was discharged from the Navy in 1955, returned to M.I.T. to finish work on his S.B., and now is a civilian instructor, teaching general engineering at N.A.S. Corry Field, Pensacola, Fla. While in the Navy, Bill did a lot of traveling with the Sixth Fleet, but he says he's pretty tied down now with his new shore job, a wife and three children, living at 208 Rue Max, Warrington, Fla.

Robert Fried is president of the Modern Machine and Tool Company, Inc., Staatsburg, N.Y. His firm specializes in research and development, pilot models, and special machinery. They help out companies in need of engineering or special equipment. They must do it fairly well, too, because last year the Frieds took a trip to Europe, visiting Spain and Holland. They have two children and live at Aberdeen Farm, Staatsburg, N.Y. Henry F. Lloyd has recently been promoted to captain, U.S. Navy, and is now director of training of the Naval Air Basic Training Command, N.A.S. Pensacola, Fla. The Lloyds, four children strong, maintain their permanent home in St. Augustine, Fla., Box 303. Calvin Newman writes to say he is director of store operations for the American Community Stores Corporation, a retail food chain. The Newmans have two children and live at 1003 Hillcrest Drive, Omaha, Neb. Calvin has been active in local affairs, having served on the boards of the American Red Cross, the United Community Services, the Regional Board A.D.L. of B'nai B'rith, and the Omaha Federation of Jewish Services.

Peter Sluis, Jr., is a technologist working on process and product economics in the Manufacturing Department of the home office of the Shell Oil Company, N.Y. Prior to moving to New York he had been at the Shell refinery at Martinez, Calif. The Sluises and their three children now make their home at 7 Hobart Court, Rochelle Park, N.J. Maxcy Daggett was with Temco Aircraft Corporation in Dallas until last July, at which time he changed jobs and is now a field engineer for the Aeronautical Division of Robertshaw-Fulton Controls Company, Anaheim, Calif. His area is southwestern United States, and his assignment is to maintain technical and sales liaison with customers for Robertshaw-Fulton's line of aircraft and missile control components. Maxcy is a registered professional engineer in Arkansas and Texas, and is a member of Texas and National Societies of Professional Engineers. The Daggetts have one son and live at 6417 Waggoner Drive, Dallas 30, Texas.

Winchell Hayward writes from his home at 2320 Broadway, San Francisco 15, Calif., to say that he is an application engineer for the Century Electric Company, whose home office is in St. Louis. He says that just prior to writing he had arrived home from this year's Naval Reserve cruise, which was to Acapulco, Mexico. That sure sounds like rough duty. John B. Blottman earned his M.S. in electrical engineering from Northeastern in 1954, and is working as a research engineer developing instrumentation for the Electrical Engineering Department of Tufts University in Medford, Mass. The Blottmans live at 4 Shelby Road, Reading, Mass. Daniel Kelley, whose marriage was reported here a month or so ago, writes to say he has changed his job from engineering editor to advertising space representative for *Architectural Record*, F. W. Dodge Corporation. Also, he has been elected to the Board of Directors of Astra Laboratories, Inc., Scotia, N.Y. The Kelleys are making their home at 331 East 71st Street, New York 21, N.Y.

Bill Herberg, who lives at 1611-C Seymour Avenue, Cincinnati 37, Ohio, reports that he is still single, and is working for Dow Corning Corporation in Cleveland. He joined Dow Corning in February 1954 and, after six months of training, was assigned to the Dallas office. He was then transferred to Tulsa and then to Cincinnati in August of 1955. His job is to handle the sales of Dow's silicone products in the Ohio area and to act as liaison man on their research and development work with Wright Air Developoment Center in Dayton, Ohio. Bill reports that Bill Pferdmenges lives practically next door. He also sees Bill Rapoport quite often, and the two of them were in attendance at Dan Kelley's wedding.

Eric Newberg, Jr., is a commander in the Navy, and has been, in order of occurence, naval inspector of Ordnance in Scranton, Pa., officer in charge of the Central Torpedo Office, Newport, R.I., and is now at the Navy Department Bureau of Ordnance as assistant program director, Nuclear Applications. He was active in Kiwanis Clubs both in Scranton and Newport, and, in 1956, was on the National Board of Directors, Armed Forces Management Association. The Newbergs have three children and live at 6712 N. Williamsburg Boulevard, Arlington 13, Va. Majed A. Akel, after receiving his S.M. in chemical engineering at M.I.T., took further graduate courses at Carnegie Tech and William and Mary. He is a partner in the architectural and engineering firm of Woodward-Akel, Yulee, Fla., and is also associated with the firm of Knoke and Akel of Pittsburgh, Pa., and Norfolk, Va. Shepard M. Arkin writes that he is changing his job from technical assistant at the Bureau of Aeronautics, Navy Department, Guided Missiles Division, to staff engineer, working on missile programs at Raytheon Manufacturing Company, Missile Systems Division, Bedford, Mass. Shepard says, "Since I am just returning to Boston after a nine-year absence, I would like to hear from all my former classmates and friends who live in the area. I can be reached through my business address until I get a new residence."

Bernard J. Haverback is a medical doctor associated with the National Heart Institute at Bethesda, Md., working on medical research. The Haverbacks have three children and live at 2558 Holman Avenue, Silver Springs, Md. Martin L. Ray left Newport Industries, Inc., in 1954, after seven years, to go into business with his two brothers, and is secretary of the Ray Construction Company, Inc., a road-building firm in Pensacola, Fla. The Rays and Martin, Jr., live at 3 Crescent Drive, Star Lake, Warrington, Fla. John L. Norton worked as a research assistant in the

M.I.T. gas turbine laboratory while earning his S.M. in mechanical engineering in 1947, and then worked for Commercial Filters Corporation, Melrose, Mass., until 1956. He is now supervisor of the Test and Evaluation Unit at the Aircraft Gas Turbine Division of the Rocket Engine Section of General Electric Company at Malta Test Station, Ballston Spa, N.Y. His work is engineering test and evaluation of rocket engine controls and components, and he makes bi-monthly trips to Los Angeles as part of his job. The Nortons and their two children live at 5 Cherry Lane, Scotia, N.Y. John reports that he visited Ralph Kenkel and his family at Ralph's home in Syosset, L.I., N.Y., last summer, and Ralph is working with Republic Aircraft Company, and doing well.

John E. Warren reports that he continued graduate work after M.I.T. for five years in digital and analogue computers, system design and evaluation, and, in September of 1956, started his own engineering organization, Automation Research and Design Associates, and serves as chief systems engineer. The firm designs and develops automatic control systems. The Warrens and their two sons live at 148 Fairway Avenue, Belleville 9, N.J. John has served as president of the Belleville Parent-Teachers' Association, served on the Lay Advisory Board to the Belleville Board of Education, and also has served on the M.I.T. Educational Council. P. Huey Wong has one daughter and lives at 1530 Jones Street, #6, San Francisco, Calif. He is assistant head of the Structural Department of West Coast Engineering Company, San Francisco. Gilbert B. Devey worked at the Navy Department until 1952 and then joined the Sprague Electric Company of North Adams, Mass., where he is coordinator of magnetic components. The Deveys have two sons and live at 160 Main Street, Williamstown, Mass. Gene Parish left M.I.T. in 1956 to join the Research Division of Raytheon Manufacturing Company, Waltham, Mass., as a research staff member and head of Mechanical Design Section of the Nuclear Power Group (present total personnel in section — one). They have hopes of getting Raytheon into the nuclear power business, at which time Gene will be in charge of 1,001 people. The Parishes have two children and live at 34 Valley Road, Concord, Mass. David Herwitz earned his LL.B. at Harvard Law School in 1949, and was associated with Mintz, Levin and Cohn, a Boston law firm until 1954, and now is an assistant professor of law at Harvard Law School. Dave is still single, and lives at 1572 Massachusetts Avenue, Cambridge, Mass.

I guess that's enough for this month. Look for us in July. — JOHN A. MAYNARD, *Secretary*, 15 Cabot Street, Winchester, Mass.

1952

If this column should reach you before the time of our Reunion, I would like to remind you about it. It's the week end of June 8 and 9 at the Mayflower Hotel at Plymouth, Mass. Dinner, drinks, dance, drinks, a clambake, drinks, recreational sports (guaranteed not to be too strenuous for the older members of the Class), drinks, and a cocktail party. Quite an opportunity to show all your friends what good shape you're in, to show off your wife or fiancée to the old beer gang, and to show everybody pictures of the cutest kids in the world. Come and reminisce about de-gaussing a ship on the 8.03 final or that jim-dandy benzene fire in organic lab. Or do you remember the day the train went through 10-250? How about the reopening of the Harvard Bridge (or to those who prefer, the Technology Bridge, or the Voo Doo Bridge), and those congenial groups around the bonfires on full-moon nights? This should have you just weeping in your beer and all set to come down for the Reunion week end. All joking aside, it looks as though there will be about 125 to 150 people around all just rarin' to go to town for a very enjoyable week end. (All this will look rather silly if this column doesn't reach you until after June 9; perhaps I should have written an alternate column for those people who get their Review late, telling about what a wonderful blast the week end was.)

Reaching into the dusty old mailbag, we find the following: Bob Naber writes from the Swedish Hospital in Seattle, Wash.: "Received my M.D. degree in June '56 from Northwestern University. Presently interning at the above." Bob Koch writes from North Bergen, N.J.: "Have resigned position as hydraulic and hydro-power engineer with Uhl, Hall, and Rich on St. Lawrence Power Project, Massena, N.Y., to return to Sanderson and Porter, consulting engineering and construction firm with worldwide activities and headquarters in New York City. Have accepted permanent staff position to be charged with investigations and reports relating to power developments and surveys, both foreign and domestic." Ed Olney from Deerfield, Ill.: "Recently left American Stores Company in Philadelphia to join Kraft Foods Research Laboratories in Glenview, Ill., as a project leader."

George DeMoss writes from Wyomissing, Pa.: "Now structural engineer for Sanders and Thomas, Inc. (consulting engineers), in Pottstown, Pa. Was head of Firestone Test Track for Firestone in Akron, Ohio." Harvey Eisenberg from Pittsburgh: "I have recently changed positions from quality control supervisor, Owens-Corning Fiberglas Corporation, Newark, Ohio, to Westinghouse Plant Apparatus Department (quality engineer) in Pittsburgh. This new work is concerned with building nuclear reactor power plant for U.S. Navy."

Dick Cole from Sheffield, Ala.: "I have been transferred from the Reynolds Metals Reduction plant in Longview, Wash., to the Listerhill Reduction Plant at Sheffield, Ala. My new position will be reduction superintendent for the new 200,000,000-pound aluminum plant now being constructed. This new plant will furnish hot metal for the new Ford Motor Company casting plant under construction." Charlie Saltsman from Middletown, Conn.: "Resigned position with Bethlehem Steel Company as marine engineer for position as engineer with the Raymond Engineering Laboratories, Middletown, Conn." Marty Fink from Glastonbury, Conn.: "My addition to the Class of 1952 Alumni news is to mention arrival of our second son, Andrew Charles Fink, on Election Day. His older brother, Howie, not quite two years old, doesn't share in the general happiness about the event. I'm still at United Aircraft Corporation, Research Department, in the High Speed Aerodynamics Group, where I cover the extremes of the speed range by working on both helicopters and hypersonics. I started out a few years ago doing transonic aerodynamics, and seem to have gone in both directions at once. We have a few other members of the Class of 1952 at the Research Department, including Frank Carta, John Wilson, and Rod Shuart. There are many M.I.T. Alumni here, Jack Rabbott'51 having joined our group recently from the National Advisory Committee for Aeronautics. Dick Quigley, also of our Class, is at Pratt and Whitney Division, United Aircraft, across the airport from us, and we see him often."

From Bill Mueser in Washington, D.C.: "Don't have too much news for your column. Had lunch a few times with Dana Ferguson, who is with Revere in New York City, during this fall. I was in California in late November and saw Steve Crosby who is at AeroJet and living in Covina, Calif., with his wife, two daughters, and a son. Ken Jonsson is also in Los Angeles area as a sales engineer, I believe, for Texas Instruments. Presently I'm here in Washington on the Sub-Surface Investigation for the Extension of the Capitol Project." And from Ed Schwartz: "For your thumbnail sketch department. I went to Harvard Business School, as you probably know, and finished in 1954. Then it was two years in the Army. I spent the majority of my time near Tokyo. While there I ran across Ted Uhler who was stationed at the same camp I was at for about six months. I am now working for Rohm and Haas Company in Philadelphia as a sales trainee."

Sarkis Zartarian, apparently shaken up by mention in this column of his whereabouts being unknown, writes: "I have a job, and I'm very happy at it. I work for Tracerlab, Inc., of Boston, and more specifically in the X-ray Division as a staff assistant to the general manager. I'm involved with budgets, sales-production relationships, internal paper work procedures, branch office control, and any other jobs my boss wants me to dig into." Ed Margulies writes: "The academic world has been left behind, in a manner of speaking. I finished my undergraduate medical work at Cornell and graduated in June. I have come up to Albany Hospital and am enrolled as a surgical intern. The internship is much to my liking and has developed into something more than I had anticipated. I will take three or four more years of training, perhaps here at Albany, before finishing the surgical program. This really isn't bad, but Old Uncle Samuel is anxiously awaiting my services. Poor old Uncle Ed is still hopelessly single, as you may imagine. Since leaving the Big City I have seen none of the old group, not that I saw many while there. But I did see Jim and Marcelle Davidson, and Dana Ferguson, and met Mike Green at the M.I.T. Club for bridge once. Charlie Beckman, M.D., graduated from Cornell in the same class as I, married Ardith

Kuehn in June, and is now an intern at Cincinnati General Hospital and seems quite happy from his letters."

And finally, I should hereby like to serve notice of my resignation from Bachelors Unanimous. Yours truly has finally seen the light and has just gotten himself engaged. My fiancée's name is Jackie Chase; she's a senior at Wellesley College at the present time. Hitching time is set for early fall. Your merry *Secretary* — STANLEY I. BUCHIN, Bay State Abrasive Products Company, Westboro, Mass.

1953

The last time I heard from Bob Stolow he was in Annister, Ala., and had just become the father of a baby girl, Marjorie Lynn. Dick Neller reports that Chuck Frederickson, wife, Marlene (Wellesley '53), and son, Frank, are located in Allston, Mass. Chuck has just finished two years in the Air Force and is attending the Harvard Business School.

During the past few months there has been a number of marital mergers. William Seaver and Sandra Stowell were married early last year in Boston. At the time of the marriage William had a position at the Ultrasonic Corporation in Cambridge, Mass. Also among last year's marriages were Warren Nelson and Dorothy Beckwith; Henry Draghi and Janet Brink; Jack Dennis and Jane Hodgson; Russell Kidder and Judith Robinson; and Richard De Cloux and Maureen Hamilton.

Roland Johnson and Eleanor Maslen were married at the Royal Air Force station at Schulthorpe, Norfolk, England. John Austin reports that he was married on July 7, 1956, to Jeanne Ansevin of Springfield, Ohio. Jeanne is a graduate of Muskingum College. A press release from the Stanolind Foundation indicates that Paul Pomeroy has been awarded a fellowship in geophysics at Columbia University. Paul was an Air Force officer and worked in the field of geophysics while completing his tour of duty. Ted Bodner and John Meader have also completed their service obligation and are back at school. Ted and his wife are living in Stuyvesant Town while Ted attends New York University's Bellevue College of Medicine. John Meader has returned to M.I.T. to work on his doctorate in chemical engineering.

Princeton University's Public Information Service reports that Bernhard Paiewonsky received a master's degree in aeronautical engineering and that Joseph Kohn received a Ph.D. in mathematics. A few of the Class members who have been in industry for some time have changed locations. Carl Wolf is now a member of the staff of Du Pont's Polychemicals Research Division. William Nelson has a position with General Electric in their Special Defense Project Department, while Myles Towne is with the Linde Air Products Company at their Tonawanda Laboratories in Tonawanda, N.Y. Bob Ebeling, after two years with the Army in France, is now at the Research and Development Department of Procter and Gamble Company. Our last note for this month; John Dunlay, after a year of study at the Oak Ridge School of Reactor Technology, is back with Convair at Ft. Worth, Texas. — VINSON W. BRONSON, JR., *Secretary*, 60 Roseland Street, Cambridge, Mass.

1955

After last month's big spread, this will really look pint-sized in comparison. We really wish we had a bit more support from you people out there. We know that 25 percent of the Class are getting The Review, and are quite proud that we have a higher percentage than any class of the past several years. However, we wish we would hear from more of you so that we would not have to write about the same people all of the time.

The saving grace this month was a very newsy letter from Chan Stevens. I know we all heard from him in the Class letter, but this one was quite a bit more detailed. Chan states that he is in the process of contacting Jacques Linder, who is in Manchester, and Lenny Wharton in Cambridge for a week end at Stratford-on-Avon. He also mentioned that Bob Greene is now the poppa of a baby girl, and that Ash and Sue Stocker are expecting. Marc Gross is now out of his six-month tour with the Army, and is back at the Patent Office in Washington, attending night classes in law at the University of Maryland and living in Arlington, Va. Sounds quite cosmopolitan, Marc.

I bumped into Fred Brooks in the lobby of Building Seven recently. He was up on business for the Electric Boat Company of New London. He recently took his master's in electrical engineering after piling up the necessary number of evening course credits at the University of Connecticut. He and his wife have been doing a lot of sailing, and admit it's really fun dodging the atomic submarines that abound in the vicinity. Tom Stockham recently received an award for excellence in teaching and scholarship as a teaching assistant and student in the M.I.T. Graduate School of Electrical Engineering.

That about winds it up for now. — DELL F. LANIER, *Secretary*, 54 West 71st Street, New York 23, N.Y. L. DENNIS SHAPIRO, *Assistant Secretary*, 1039 Massachusetts Avenue, Cambridge 38, Mass.

1956

By the time you read this article we will be celebrating our first anniversary. We are no longer the youngest member of the Alumni family, but, considering that the Class of 1887 is celebrating its 70th reunion, we have a long way to go. As we think of our years at Tech it is a good time to review the "most wanted Class's" achievements and re-evaluate our plans for the future. Positive achievements in the field of science and business are probably few, but the patterns for the future are forming. Our greatest steps are probably in our personal life with marriage or contemplation of it foremost in our minds. Many are finding participation in the defense of the country an immediate interruption in plans. The rapidly forming and possibly confining pattern of our future should be evaluated now, for changes and improvements become difficult after the pattern is firm to the point of habit. Take time this week to think and talk it over with those who will share your future. This training of ours is as much a way of life as a way of earning.

In the recent letter from Fort McClellan, Robert Greene has added these classmates to the roster of those hallowed barracks and smoky officers' club: Robert Alter, John Basile, Bernard Benson, John Cotter, John Cronin, Harold Friedman, John Gignac, William Horton, and James Mozzicato. No wonder the chemical industry needs men. In other armed forces announcements, George Luhrmann writes that he expects to report for active duty in June. Morrin Hazel is now on duty at the Watertown Arsenal. Thomas Hoffman is at Moultrie, Ga.; John Hartigan has completed basic at Fort Lee, Va.; and Harry Wertheimer is at Fort Leonard Wood, Mo.

Weddings and engagements are headed by Larry Goldberg, who became engaged to Iris Dale Rubenstein of Chestnut Hill in April. Morton Allen wed Jacqueline Bean of Waban on January 2. Murray Gerber wed Shirley Roberta Greene of Dorchester in February. Hans Hoeflein wed Ernestine Squadrito of Mystic, Conn., on February 2. Jerome Vielehr wed Patricia Ware Driscoll of Haddonfield, N.J., on March 30.

One day last month I was eating lunch at a restaurant by the name of the Gypsy Tea Room in Calvert City, Ky. At the next table I spied a familiar face — yep, a classmate, John Mayer, who is working at the General Aniline and Film plant in Calvert. An odd statistic: When I report for active duty this month, approximately 50 pounds of my luggage will pertain to the Class. You men are heavy! When you write me about weddings and engagements, would you please include the young lady's maiden name and home town. In birth announcements the baby's first name would be helpful.

To close, a sad and yet encouraging observation; our Class has been saddened by the death of only one member so far — David F. duPont in September, 1955. — BRUCE B. BREDEHOFT, *Secretary*, 1528 Dial Court, Springfield, Ill. M. PHILLIP BRYDEN, *Assistant Secretary*, 3512 Shutter Street, Montreal, Quebec, Canada.

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Monday, June 10, 1957

at

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1. Morning symposium on "Today's Science – Tomorrow's Promise" with Chancellor J. A. Stratton'23 presiding.

James B. Fisk'31, Executive Vice-president of the Bell Telephone Laboratories will speak on the physical sciences.

Jerrold R. Zacharias, Professor of Physics at M.I.T., will speak on science for the layman and high school student.

2. Luncheon in Du Pont Court, at which President Killian will comment on recent M.I.T. developments and honor eleven members of the Institute's Faculty and Staff who retire July 1.

3. Dedication of the Karl Taylor Compton Laboratories, at which Thomas J. Watson, President of International Business Machines Corporation, Vannevar Bush'16, Chairman of the M.I.T. Corporation, and George R. Harrison, Dean of the School of Science, will join President Killian in paying tribute to Dr. Compton.

4. Visits to the Computation Center and Nuclear Reactor.

5. Pre-dinner gathering on green of Briggs Field.

6. Alumni Banquet in Rockwell Cage.

7. Concert by the Boston Pops Concert, with Arthur Fiedler conducting, in Kresge Auditorium.

Wire sculpture by Henry Szafarz

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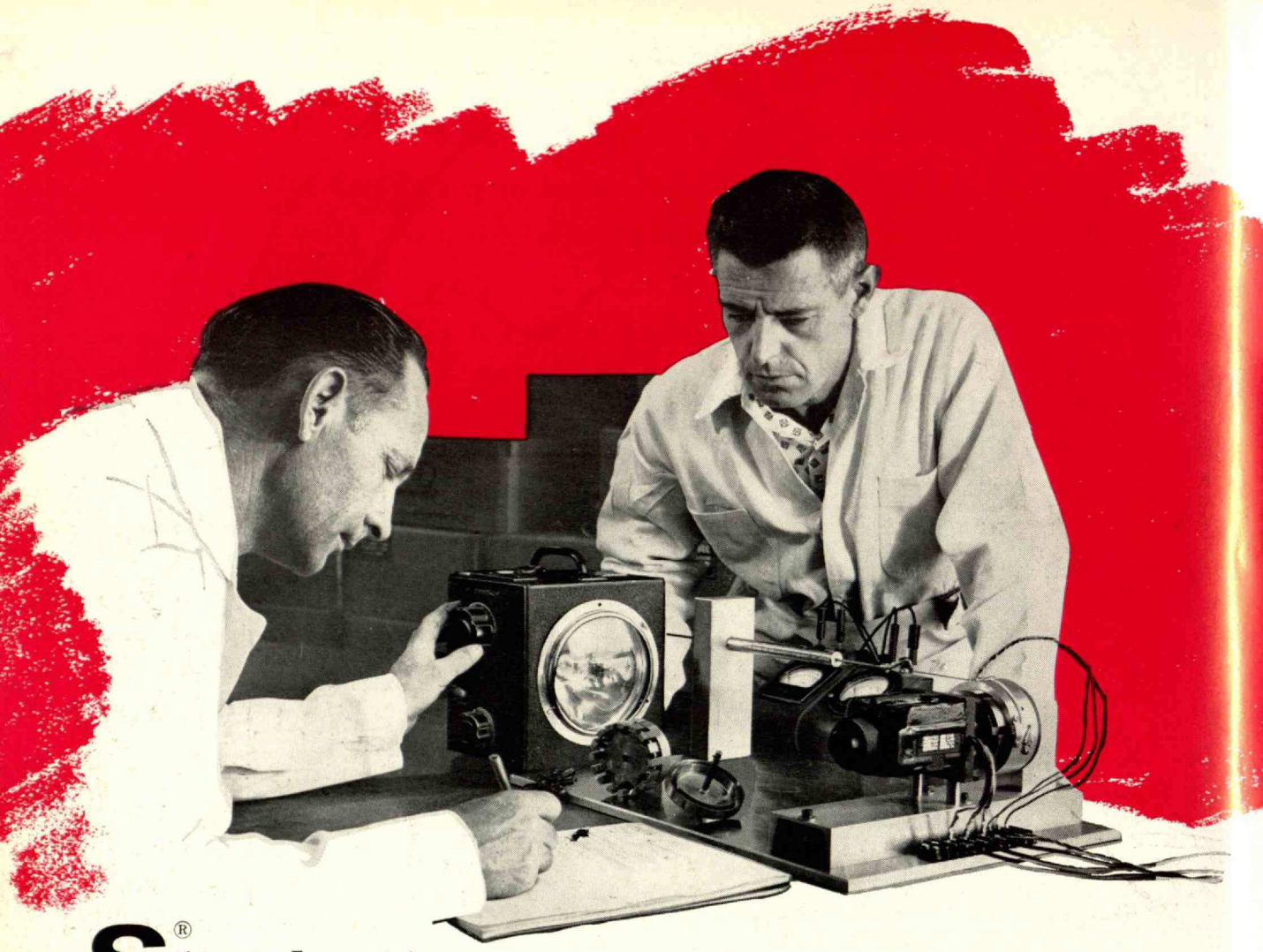

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